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GLOBAL DATA MONITORING REPORT

NOVEMBER 1999

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS $\geq$ 20 , and one or more of the following:

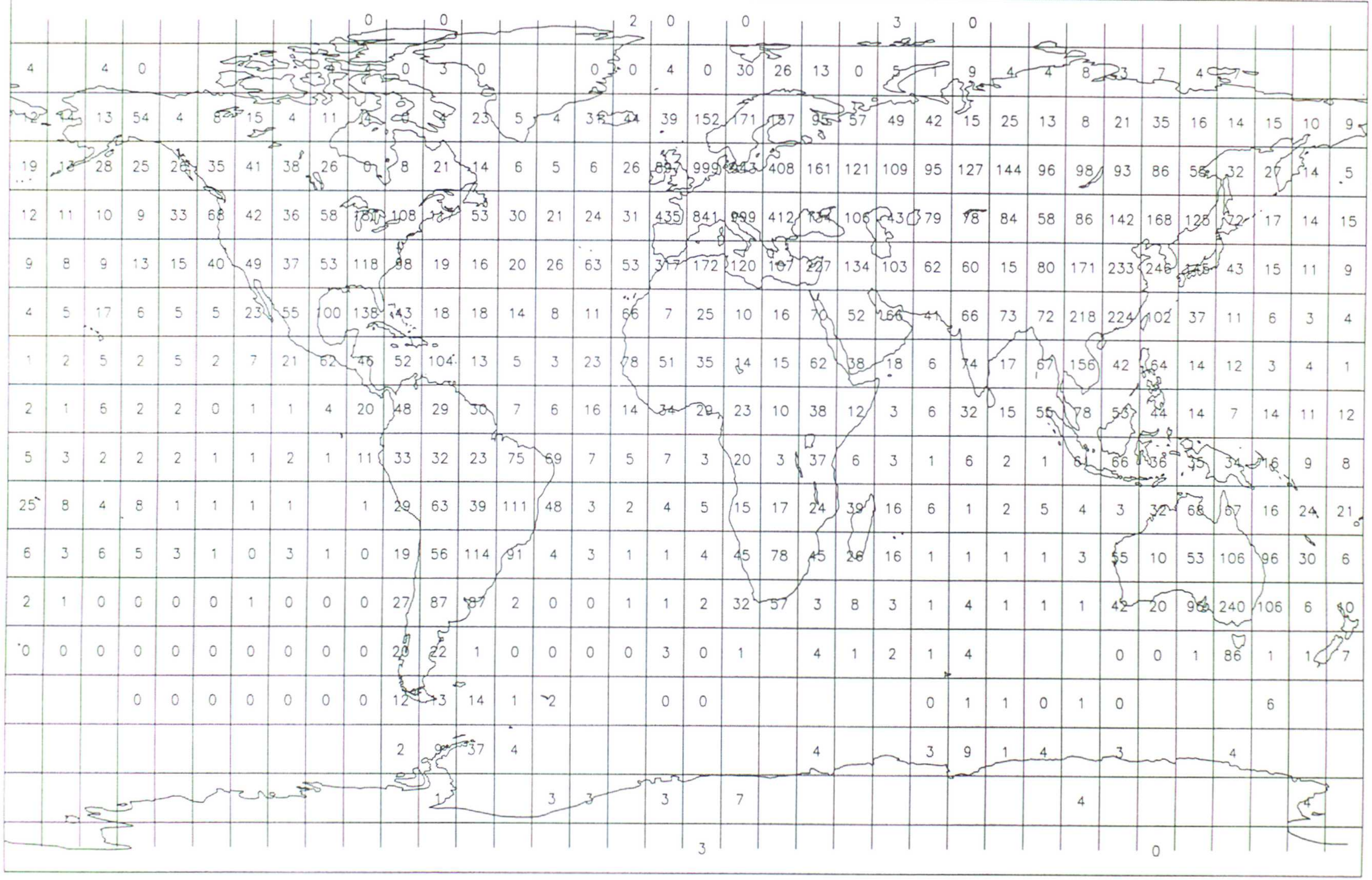
1.|bias|	$\geq$ 4 hPa	(pressure),
	$\geq$ 5 m s^{-1}	(wind speed),
	$\geq$ 30 degrees	(direction).
2.SD	$\geq$ 6 hPa	(pressure),
	$\geq$ 80 degrees	(direction).
3.PGE	$\geq$ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
BOAB	ALL	P	SUR	42	0	0	2.4	-4.5	5.1
ELJJ5	ALL	P	SUR	29	4	14	6.8	1.2	6.9
ELMQ	ALL	P	SUR	29	0	0	1.9	-4.7	5.0
ELVI2	ALL	P	SUR	74	0	0	1.3	-5.7	5.9
ELVJ9	ALL	P	SUR	82	0	0	1.0	-4.1	4.3
ELWH8	ALL	P	SUR	58	14	24	6.1	-1.4	6.3
FNCI	ALL	P	SUR	27	0	0	1.3	-4.7	4.9
LAEP4	ALL	P	SUR	35	0	0	2.1	-4.3	4.8
LAFQ5	ALL	P	SUR	44	7	16	1.2	-5.0	5.1
PCCQ	ALL	P	SUR	41	0	0	0.9	-6.7	6.7
PGWB	ALL	P	SUR	39	0	0	1.3	-5.4	5.5
P3YR5	ALL	P	SUR	20	0	0	1.1	4.3	4.4
P3YS5	ALL	P	SUR	76	0	0	1.4	4.0	4.2
UAIS	ALL	P	SUR	70	0	0	1.0	-10.2	10.2
UCAD	ALL	P	SUR	20	0	0	0.9	-6.0	6.1
VDLC	ALL	P	SUR	23	1	4	2.0	-8.0	8.2
VYNG	ALL	P	SUR	35	33	94	0.3	11.8	11.9
WDZB	ALL	P	SUR	33	0	0	0.9	-5.3	5.4
ZCAM9	ALL	P	SUR	32	0	0	1.8	9.1	9.2
3FGN3	ALL	P	SUR	21	0	0	1.0	-9.3	9.3
3FIC5	ALL	P	SUR	27	9	33	3.5	-2.1	4.1
48102	ALL	P	SUR	625	270	43	1.1	0.4	1.2
62125	ALL	P	SUR	75	1	1	1.1	5.0	5.1
8PNI	ALL	P	SUR	29	0	0	0.9	-4.4	4.5
8PNK	ALL	P	SUR	22	4	18	6.5	5.9	8.8
9KKL	ALL	P	SUR	57	6	11	5.0	-5.2	7.2
WIND SPEED									
C6JE5	ALL	SPEED	SUR	44	0	0	3.2	-7.1	7.7
C6NI3	ALL	SPEED	SUR	20	0	0	4.0	7.4	8.4
DGCDFD	ALL	SPEED	SUR	69	0	0	5.2	8.0	9.5
ELGG3	ALL	SPEED	SUR	53	0	0	5.6	6.1	8.3
ELTZ2	ALL	SPEED	SUR	27	0	0	3.7	5.2	6.4
ELVK2	ALL	SPEED	SUR	26	0	0	5.5	12.2	13.4
J8GK8	ALL	SPEED	SUR	55	0	0	4.2	5.2	6.6
LAKS5	ALL	SPEED	SUR	58	0	0	3.6	5.1	6.2
PDTQ	ALL	SPEED	SUR	22	0	0	7.2	6.7	9.8
PJVQ	ALL	SPEED	SUR	36	0	0	4.6	5.3	7.0
SXYY	ALL	SPEED	SUR	43	0	0	6.5	5.0	8.1
UCTP	ALL	SPEED	SUR	32	0	0	3.4	6.0	6.9
V2TE	ALL	SPEED	SUR	26	0	0	7.3	8.3	11.1
WGZK	ALL	SPEED	SUR	25	0	0	4.2	5.1	6.6
3FSL4	ALL	SPEED	SUR	49	0	0	3.0	6.0	6.8
3FTW	ALL	SPEED	SUR	49	0	0	4.9	8.7	10.0
3FWM4	ALL	SPEED	SUR	73	0	0	4.6	6.2	7.7
42041	ALL	SPEED	SUR	205	0	0	1.5	-5.3	5.5
9HII6	ALL	SPEED	SUR	42	0	0	4.8	8.3	9.6
WIND DIRECTION									
FPSS	ALL	DIRN.	SUR	125	0	0	104.5	-17.3	106.0
MSKR4	ALL	DIRN.	SUR	25	0	0	44.1	-32.6	54.9
VRUH8	ALL	DIRN.	SUR	24	0	0	60.7	43.0	74.4
3FFR6	ALL	DIRN.	SUR	32	0	0	35.4	-65.8	74.7

AVAILABILITY – SHIP/SYNOP – NOVEMBER 1999
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21234

FIGURE 1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19 18 28 25 28 35 41 38 26 0 8 21 14 6 5 6 26 89 999 843 408 161 121 109 95 127 144 96 98 93 86 56 32 27 14 5
12 11 10 9 33 68 42 36 58 181 108 18 53 30 21 24 31 435 841 999 412 134 106 43 79 78 84 58 86 142 168 125 72 17 14 15
9 8 9 13 15 40 49 37 53 118 88 19 16 20 26 63 53 317 172 120 107 227 134 103 62 60 15 80 171 233 246 135 43 15 11 9
4 5 17 6 5 5 23 55 100 138 43 18 18 14 8 11 66 7 25 10 16 70 52 166 41 66 73 72 218 224 102 37 11 6 3 4
1 2 5 2 5 2 7 21 62 46 52 104 13 5 3 23 78 51 35 14 15 62 38 18 6 74 17 67 156 42 64 14 12 3 4 1
2 1 6 2 2 0 1 1 4 20 48 29 30 7 6 16 14 34 29 23 10 38 12 3 6 32 15 55 78 53 44 14 7 14 11 12
5 3 2 2 2 1 1 2 1 11 33 32 23 75 69 7 5 7 3 20 3 37 6 3 1 6 2 1 61 66 36 35 34 16 9 8
25 8 4 8 1 1 1 1 1 29 63 39 111 48 3 2 4 5 15 17 24 39 16 6 1 2 5 4 3 32 68 67 16 24 21
6 3 6 5 3 1 0 3 1 0 19 56 114 91 4 3 1 1 4 45 78 45 26 16 1 1 1 1 3 55 10 53 106 96 30 6
2 1 0 0 0 0 1 0 0 0 27 87 87 2 0 0 1 1 2 32 57 3 8 3 1 4 1 1 1 42 20 96 240 106 6 10
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2 9 37 4 4 3 9 1 4 3 4
1 3 3 3 7 4 4
3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
	3.PGE	≥ 25.	

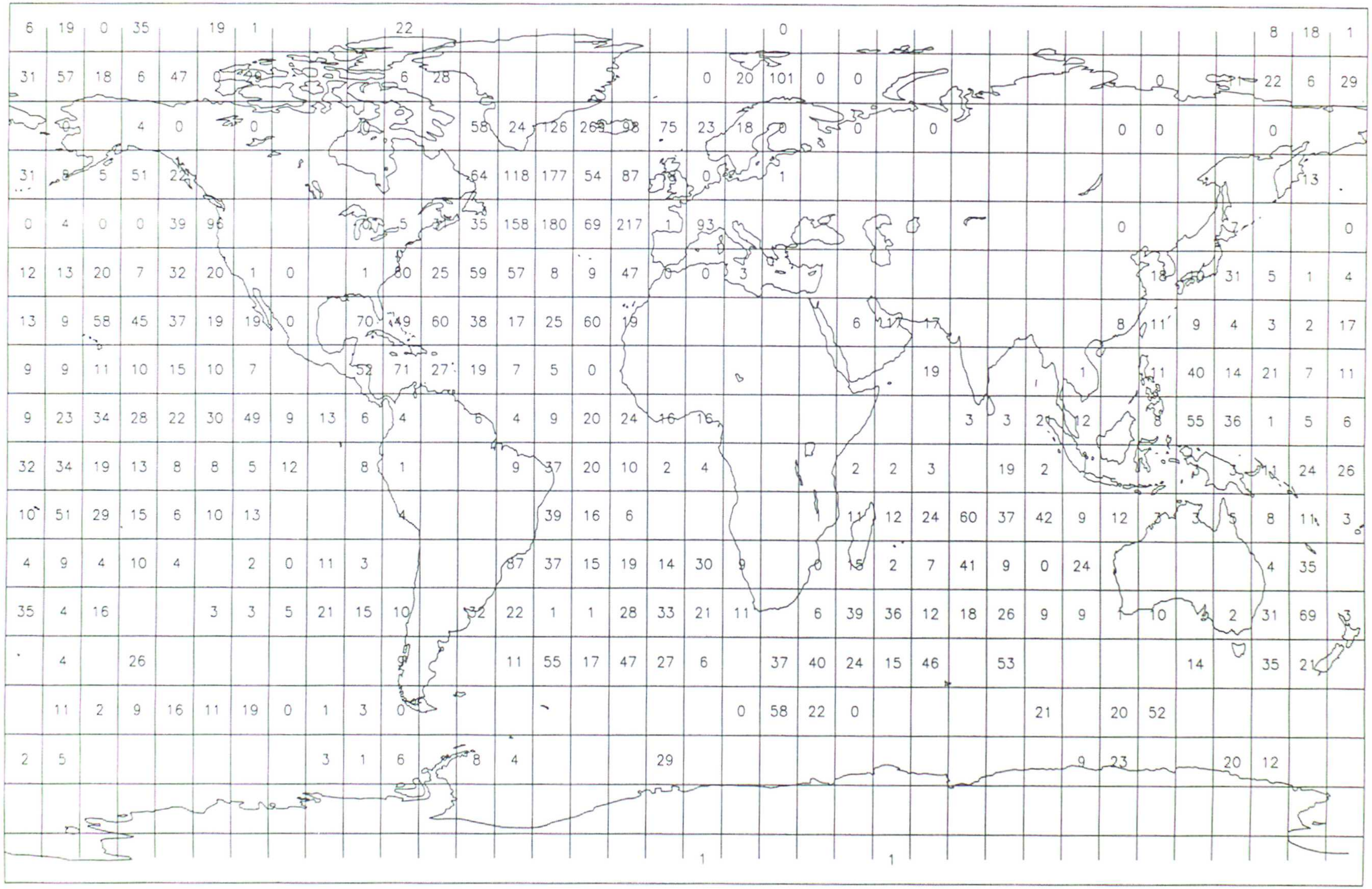
N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
15536	-29.7	-23.5	ALL	P	SUR	203	2	1	6.0	0.4	6.0
23508	28.4	48.9	ALL	P	SUR	184	0	0	0.7	-5.2	5.2
31953	-20.8	-40.7	ALL	P	SUR	303	1	0	3.7	8.2	9.0
33946	-44.8	-32.7	ALL	P	SUR	44	23	52	8.5	-2.2	8.8
41629	9.9	-20.0	ALL	P	SUR	33	33	100			
41653	19.8	-70.7	ALL	P	SUR	98	0	0	0.8	-4.2	4.2
41852	35.4	-55.0	ALL	P	SUR	80	61	76	2.4	-10.1	10.4
44778	51.4	-5.3	ALL	P	SUR	163	2	1	1.6	-9.1	9.2
46508	-0.8	-171.5	ALL	P	SUR	35	35	100			
46768	53.4	-141.8	ALL	P	SUR	260	10	4	4.7	4.0	6.1
52542	47.1	-60.4	ALL	P	SUR	98	98	100			
54809	2.1	138.1	ALL	P	SUR	90	90	100			
54811	0.0	147.0	ALL	P	SUR	87	87	100			
54923	-22.5	-97.5	ALL	P	SUR	114	0	0	1.0	-6.2	6.3
65593	64.1	-21.8	ALL	P	SUR	318	4	1	2.1	-5.6	6.0
WIND SPEED											
21612	27.8	129.7	ALL	SPEED	SUR	107	0	0	3.0	-5.7	6.4
41524	17.8	-71.0	ALL	SPEED	SUR	51	0	0	4.1	5.2	6.6

AVAILABILITY – DRIFTER – NOVEMBER 1999

FIGURE 2

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 7282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0 4 0 0 39 96 5 7 35 158 180 69 217 1 93 0 0
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10 51 29 15 6 10 13 4 39 16 6 1 11 12 24 60 37 42 9 12 7 3 5 8 11 3
4 9 4 10 4 2 0 11 3 87 37 15 19 14 30 9 0 15 2 7 41 9 0 24 4 35
35 4 16 3 3 5 21 15 10 32 22 1 1 28 33 21 11 6 39 36 12 18 26 9 9 1 10 2 2 31 69 3
4 26 11 55 17 47 27 6 37 40 24 15 46 53 14 35 21
11 2 9 16 11 19 0 1 3 0 0 58 22 0 21 20 52
2 5 3 1 6 8 4 29 9 23 20 12
1 1

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	105	0	0	1	0.8	4.9	5.0
60468	35.6N	6.2E	1052	S8	107	107	100	0			
60511	35.3N	1.4E	1127	S8	108	99	92	0	0.3	14.7	14.7
60535	34.7N	3.3E	1144	S8	79	1	1	0	0.9	-6.0	6.1
60670	24.6N	9.5E	1054	S8	95	0	0	0	0.9	9.7	9.7
63330	13.5N	39.5E	2070	MS	48	48	100	0			
63333	11.1N	39.7E	1903	MS	71	1	1	0	0.8	5.1	5.2
63334	10.3N	37.7E	2515	MS	68	0	0	0	0.9	10.5	10.5
63402	7.7N	36.8E	1725	MS	49	0	0	0	0.7	7.7	7.7
63450	9.0N	38.8E	2354	MS	88	1	1	1	0.5	4.5	4.5
63471	9.6N	41.9E	1260	MS	81	0	0	0	0.9	10.7	10.7
63478	5.9N	43.6E	295	MS	56	0	0	0	0.8	6.1	6.2
68030	18.5S	25.6E	1071	8	29	1	3	3	1.6	4.9	5.2
68038	20.5S	26.0E	903	8	26	0	0	15	1.3	4.4	4.6
68396	26.5S	31.3E	641	S8	54	0	0	0	0.9	4.5	4.6

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24688	63.3N	143.2E	741	MS	113	19	17	0	4.3	5.3	6.8
30320	56.9N	105.7E	669	MS	116	59	51	0	1.9	1.6	2.5
30967	49.9N	115.8E	623	MS	78	1	1	0	1.4	-4.6	4.8
40701	39.3N	44.4E	1470	MS	102	0	0	93	1.6	6.3	6.5
40738	36.8N	54.5E	155	MS	88	66	75	97	0.9	13.5	13.5
40741	36.6N	61.2E	235	MS	66	2	3	62	2.0	-4.0	4.5
40743	36.2N	57.7E	941	MS	108	0	0	1	1.3	-4.6	4.8
40762	35.3N	59.2E	1333	MS	109	2	2	0	0.9	-12.1	12.1
40763	35.2N	58.5E	1060	MS	47	0	0	36	1.0	-4.6	4.7
40783	32.4N	49.7E	1972	MS	92	2	2	88	1.3	-4.7	4.9
40789	33.8N	55.1E	921	MS	80	2	3	95	0.9	8.0	8.1
40812	32.0N	49.3E	372	MS	86	1	1	70	1.6	4.8	5.1
40836	30.8N	51.7E	1880	MS	65	0	0	97	0.8	6.7	6.7
40859	29.0N	53.7E	1383	MS	89	2	2	99	0.8	8.1	8.1
41254	23.1N	57.7E	1755	S8	79	79	100	0			
41535	34.2N	73.3E	1308	8	41	1	2	93	1.3	-4.6	4.8
44416	28.6N	81.6E	720	MS	56	1	2	2	1.0	4.8	4.9
47022	40.8N	128.2E	1200	S	51	2	4	4	1.2	4.8	4.9
51334	44.6N	82.9E	321	M	116	0	0	51	3.3	5.8	6.7
51379	44.0N	89.6E	794	M	116	0	0	41	3.1	5.7	6.5
51495	43.5N	91.6E	874	M	117	7	6	26	2.5	10.6	10.9
51818	37.6N	78.3E	1376	M	117	0	0	23	2.7	5.0	5.7
52602	38.8N	93.4E	2734	S	116	0	0	0	1.3	-4.1	4.3
52955	35.6N	100.8E	3201	S	116	0	0	0	0.7	13.1	13.1
53083	44.6N	114.2E	1183	M	117	1	1	62	2.4	5.4	5.9
53352	41.7N	110.4E	1377	M	116	0	0	39	1.8	4.5	4.8
53588	39.0N	113.5E	2898	S	117	117	100	0			
54587	39.1N	123.2E	-39	M	102	0	0	1	1.2	-4.3	4.5
56287	30.0N	103.0E	629	M	117	0	0	2	1.4	4.2	4.4
56385	29.5N	103.3E	3049	S	118	0	0	11	1.7	-5.1	5.4
56444	28.5N	98.9E	3488	S	117	9	8	2	0.5	14.0	14.0
56462	29.0N	101.5E	2994	S	118	1	1	2	1.5	9.7	9.8
56954	22.6N	99.9E	1054	M	117	0	0	7	2.0	4.3	4.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	39	0	0	0	1.5	-6.4	6.6
82246	2.6S	54.9W	176	MS	70	1	1	1	1.9	4.1	4.5
82704	7.6S	72.7W	170	MS	74	0	0	0	1.3	-4.0	4.2
83214	10.3S	54.9W	285	MS	63	0	0	0	3.3	-5.4	6.3
83235	12.4S	46.4W	604	MS	75	1	1	0	0.9	6.6	6.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
83319	14.7S	52.4W	315	MS	70	1	1	0	1.3	-4.7	4.9
83332	14.1S	46.4W	826	MS	75	6	8	0	0.9	13.4	13.4
83408	14.3S	43.8W	447	MS	73	0	0	0	0.9	10.9	10.9
83423	16.7S	49.3W	741	MS	74	1	1	1	0.8	-4.8	4.9
83488	17.8S	42.9W	1097	MS	73	73	100	0			
83531	18.6S	46.5W	940	MS	70	0	0	0	0.9	-6.9	7.0
83587	19.9S	43.9W	850	MS	75	0	0	3	1.3	-7.1	7.2
83773	23.1S	48.9W	793	MS	41	0	0	0	1.2	-9.7	9.8
83836	25.5S	50.6W	837	MS	76	0	0	0	0.7	-4.7	4.8
83953	30.9S	55.5W	231	MS	76	0	0	97	0.9	-10.8	10.8
84377	3.8S	73.3W	125	MS	90	0	0	11	1.5	4.5	4.7
84401	5.2S	80.6W	49	MS	87	0	0	0	0.9	4.4	4.5
84425	5.9S	76.1W	179	MS	43	0	0	2	2.0	4.5	4.9
84455	6.5S	76.4W	281	MS	62	0	0	2	1.5	7.2	7.4
84472	7.1S	78.5W	2620	S	47	3	6	4	1.6	-6.3	6.5
84474	7.2S	76.7W	350	S	42	0	0	100	1.4	9.3	9.4
84501	8.1S	79.0W	26	MS	90	0	0	0	0.9	4.0	4.1
84686	13.6S	72.0W	3248	S	85	0	0	0	1.0	-4.8	4.9
84688	13.7S	73.4W	3444	S	34	0	0	100	1.0	-8.7	8.8
84720	14.9S	75.0W	567	MS	63	0	0	0	0.7	4.9	4.9
84782	18.1S	70.3W	468	MS	89	0	0	0	1.3	8.6	8.7
85140	14.3S	67.4W	140	MS	53	0	0	9	1.7	4.8	5.1
85312	19.8S	63.9W	992	S	45	3	7	0	1.5	-10.5	10.6
85394	22.8S	64.3W	381	MS	45	0	0	0	1.6	4.3	4.6
85406	18.3S	70.3W	55	M	114	0	0	0	0.9	5.9	6.0
85432	22.5S	68.9W	2320	S8	84	0	0	0	0.8	6.1	6.2
88903	54.3S	36.5W	3	M	52	0	0	48	2.4	-7.5	7.9

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70194	66.6N	145.3W	431	S	109	109	100	6			
71434	55.2N	85.1W	10	MS	110	0	0	15	1.5	-4.6	4.8
72376	36.8N	108.2W	1677	M	116	0	0	5	2.6	7.1	7.6
72475	38.4N	113.0W	1536	M	103	0	0	17	2.6	4.4	5.1
76055	31.0N	114.9W	440	MS	46	46	100	0			
76118	30.4N	109.7W	1040	MS	35	1	3	3	1.9	-10.3	10.5
76632	20.1N	98.7W	2417	MS	29	1	3	0	0.7	-5.3	5.3
76658	19.2N	103.7W	494	MS	44	0	0	0	0.8	6.0	6.1
76750	18.5N	88.3W	9	MS	78	0	0	0	1.0	-8.2	8.3
76773	17.8N	97.8W	1680	MS	25	1	4	4	0.8	8.2	8.2
76775	17.1N	96.7W	1550	MS	61	0	0	2	0.7	4.6	4.7
76845	16.7N	92.6W	2276	MS	45	45	100	0			
78718	14.4N	87.6W	626	S	25	15	60	0	0.3	-14.3	14.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	351	351	100	0			
92010	6.1S	145.4E	1587	M	35	0	0	0	1.4	9.7	9.8
95611	34.6S	118.5E	107	MS	109	2	2	98	2.1	9.2	9.4
95909	36.5S	148.3E	1957	MS	116	116	100	0			
96751	6.7S	106.9E	920	S8	57	0	0	4	1.2	-4.1	4.3

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
10557	50.5N	11.1E	845	S8	354	354	100	0			
10954	47.8N	10.9E	540	S8	158	158	100	40			
12140	54.4N	18.7E	2	MS	118	0	0	100	0.7	8.1	8.1
13269	44.3N	19.9E	176	MS	112	2	2	100	1.1	8.8	8.9
13593	41.3N	22.4E	1031	8	51	0	0	27	1.3	-5.9	6.0
14528	44.8N	15.9E	246	S	53	1	2	74	2.7	4.6	5.3
14554	44.9N	18.4E	140	S	28	0	0	100	0.9	-12.0	12.0
14650	43.8N	18.0E	967	S	33	3	9	82	1.0	-6.3	6.4
16227	41.9N	13.6E	655	MS	354	273	77	0	1.4	-13.2	13.3
16470	36.8N	12.0E	191	MS	72	0	0	49	1.6	-4.3	4.6
17042	41.4N	41.4E	33	M	111	0	0	0	1.5	4.3	4.6
17092	39.8N	39.5E	1218	S8	114	0	0	2	1.4	7.1	7.2
17203	38.9N	40.5E	1177	S8	109	0	0	0	0.8	4.6	4.7

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89108	89.0S	1.0W	2755	S	278	0	0	0	1.1	5.2	5.3
89266	72.2S	60.3W	91	S	231	178	77	46	3.4	-13.1	13.5
89272	75.0S	70.8W	1395	S	145	66	46	0	3.1	-13.0	13.4
89327	73.2S	127.1W	30	S	245	220	90	44	6.3	-7.6	9.9
89612	66.3S	110.8E	390	S	218	218	100	0			
89667	78.0S	166.5E	10	S	284	92	32	18	6.8	0.8	6.8
89744	74.0S	43.0E	3353	S	267	0	0	0	0.6	8.0	8.0
89769	78.5S	168.4E	50	S	62	62	100	31			
89774	73.4S	76.8E	2563	S	277	0	0	0	0.9	4.3	4.4
89805	74.1S	109.8E	3096	S	231	75	32	2	1.7	2.1	2.7
89847	67.6S	146.0E	30	S	297	0	0	21	2.6	-7.1	7.6
89872	78.0S	170.8E	45	S	274	0	0	41	1.1	7.1	7.2

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:70.0 - 500.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

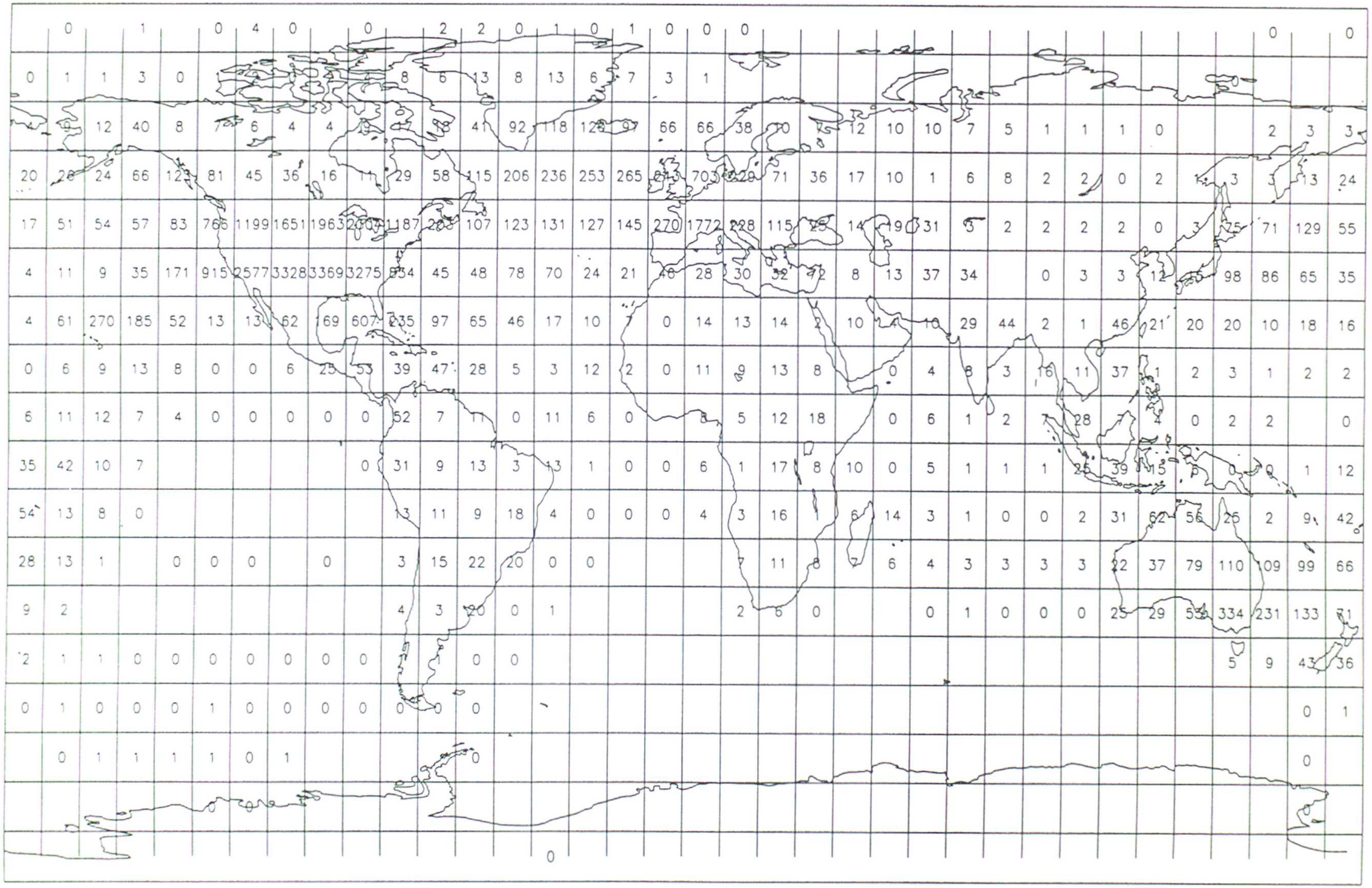
NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	59	0	41	1.4	0.5	59	0	41	0	6.6	0.9
AAH	111	0	19	1.8	0.0	111	0	19	0	9.2	2.7
AAL	6489	0	14	1.6	0.2	6449	0	15	0	9.2	0.7
AAR	1666	0	7	1.8	-0.4	1651	0	8	0	9.0	0.4
ACA	2055	0	2	1.6	-0.2	2086	0	3	0	7.3	0.7
ACI	66	8	52	1.2	0.0	61	0	48	0	9.7	3.9
AEA	548	1	5	2.1	0.8	515	0	5	0	8.6	1.3
AEL	619	2	17	2.8	0.7	604	0	9	0	8.4	0.7
AEY	75	0	3	1.4	0.9	75	0	7	0	9.0	2.4
AFL	447	1	3	1.9	0.6	443	1	3	0	7.0	0.5
AFR	2073	1	7	1.7	0.2	2081	0	8	0	8.3	0.8
AIH	434	1	5	1.5	-0.1	435	0	5	0	7.8	0.3
AJM	135	0	3	1.3	-0.2	135	0	4	0	6.7	0.7
AME	20	5	15	2.5	-1.3	20	0	10	0	6.5	1.8
AMM	120	2	8	1.8	0.5	115	0	8	0	8.1	-0.1
AMT	628	0	39	1.7	0.6	634	0	40	0	8.8	0.8
AMX	331	2	7	2.1	0.4	325	0	6	0	10.2	0.3
ANA	1310	0	7	1.7	-0.1	1305	0	8	0	8.5	0.8
ANZ	4145	1	48	1.6	0.0	4093	0	47	0	8.1	0.9
AOM	965	1	7	1.7	0.7	960	0	7	0	8.5	1.0
ARG	120	5	33	2.6	1.1	120	0	29	0	10.2	1.3
AUA	33	3	6	1.8	0.2	32	0	0	0	8.0	0.8
AUT	25	0	12	3.1	0.1	25	0	16	0	16.9	-0.3
AVA	606	1	4	1.7	0.6	610	0	5	0	9.3	0.8
AVE	194	2	3	1.7	0.9	194	1	5	0	10.6	2.0
AVN	110	3	35	1.4	0.1	112	0	34	0	8.1	0.8
AXF	73	19	53	1.2	0.4	59	0	46	0	11.2	2.4
AZA	594	4	15	2.6	0.9	583	0	8	0	9.4	1.2
BAF	25	4	8	1.7	-1.0	25	0	4	0	6.4	2.6
BAL	401	0	7	1.5	0.0	400	0	9	0	9.3	1.2
BAW	1819	1	8	1.7	-0.1	1836	0	10	0	8.7	0.9
BBB	62	2	3	1.8	-0.6	63	0	0	0	7.0	1.3
BLX	58	0	2	1.7	0.2	55	0	4	0	7.6	1.7
BWA	321	1	4	2.0	1.5	319	0	7	0	9.7	1.0
CAL	492	0	7	2.1	0.6	508	0	7	0	8.9	0.7
CCA	230	2	9	2.6	0.4	248	2	25	0	15.5	-0.8
CDN	1901	0	6	1.9	0.2	1902	0	6	0	8.6	0.5
CES	280	1	8	1.6	0.4	284	1	10	0	11.2	-0.4
CFC	44	0	9	2.3	1.1	44	0	9	0	6.8	0.7
CFG	1477	1	5	1.6	-0.6	1477	0	5	0	7.9	0.8
CKS	495	1	34	2.1	1.1	491	0	35	0	7.5	0.0
CKT	178	1	4	1.9	1.0	170	0	6	0	9.5	1.0
CLX	394	1	5	1.8	-0.4	394	0	3	0	7.0	1.0
CMI	352	1	3	1.7	0.7	368	0	4	0	10.2	0.6
CMM	378	0	19	1.8	0.0	367	0	20	0	8.2	0.8
COA	1469	1	17	1.5	0.2	1479	0	20	0	11.6	1.7
CPA	61	0	2	1.6	0.8	71	0	4	0	9.3	1.1
CRL	585	2	10	1.6	0.8	579	0	8	0	7.3	1.0
CSN	71	3	7	1.9	0.6	71	4	8	0	8.2	-0.4
CTB	172	1	2	1.3	0.2	175	0	3	0	9.0	0.8
CUB	369	1	4	2.0	1.3	371	0	4	0	8.8	1.1
DAL	4064	0	26	1.6	0.3	4077	0	27	0	7.9	0.6
DBY	699	1	3	1.6	-0.3	689	0	4	0	8.3	0.6
DLH	2758	0	6	1.6	-0.1	2726	0	6	0	8.0	0.9
EEZ	98	3	8	2.3	1.6	96	1	8	0	10.2	0.7
EIA	498	2	38	1.9	0.8	485	0	39	0	9.4	1.1
ELY	139	1	2	1.5	0.3	140	1	5	0	7.6	1.3
EVA	2107	0	4	1.6	-0.1	2129	0	5	0	9.0	0.4
EWW	65	3	8	1.6	0.3	65	0	5	0	7.8	1.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FDX	1553	1	14	1.7	0.6	1567	0	15	0	8.6	0.7
FIN	415	0	5	1.8	0.4	410	0	5	0	7.8	0.2
FJI	1101	9	44	1.9	0.3	985	0	38	0	8.2	0.7
FOM	222	17	51	1.4	0.3	181	0	43	0	8.0	1.0
FWQ	29	7	52	0.8	0.5	29	0	52	0	11.0	0.8
GAF	84	0	2	1.6	0.0	86	0	2	0	8.7	-0.6
GCO	67	1	16	2.5	1.4	71	0	17	0	9.0	1.2
GHA	61	2	2	1.5	0.5	59	0	0	0	9.3	3.3
GIA	43	7	35	1.7	1.2	42	0	31	0	4.7	0.1
GRL	55	0	2	1.8	-0.1	54	0	2	0	8.9	-0.3
GTI	172	1	9	2.0	-0.1	181	1	9	0	9.6	0.0
HAL	3224	0	34	1.5	0.6	3210	0	35	0	10.3	1.1
HBI	26	0	23	1.3	0.1	27	0	22	0	7.8	0.6
HLF	117	1	2	1.5	-0.5	117	1	3	0	7.7	2.1
HRH	175	26	73	2.1	0.5	148	0	65	0	8.0	1.0
HVN	22	5	5	1.4	0.8	20	0	0	0	6.4	2.3
IBE	2698	1	8	1.8	0.4	2665	0	8	0	8.6	0.7
ICE	1241	1	3	1.5	0.0	1240	0	4	0	7.9	0.9
IWD	233	1	7	1.3	-0.4	230	0	8	0	9.1	2.1
JAA	111	2	11	2.3	1.4	111	0	7	0	6.3	2.3
JAL	6686	0	4	1.8	0.4	6680	0	5	0	8.8	1.0
JAZ	329	0	4	2.0	1.4	326	0	6	0	9.1	0.6
JKK	253	1	6	1.5	0.2	225	1	6	0	7.9	0.9
KAL	3440	1	9	1.8	-0.1	3445	0	10	0	9.2	0.9
KIW	34	3	38	3.5	2.9	33	0	36	0	8.0	1.7
KLM	2990	0	15	1.9	0.5	3001	0	14	0	8.1	0.8
LAN	46	0	4	2.3	0.3	47	0	11	0	14.6	2.3
LAP	86	0	26	2.2	1.2	84	1	33	0	12.7	3.7
LDA	215	0	7	1.4	0.2	208	0	8	0	6.5	0.7
LDI	506	0	100	1.8	-0.5	505	0	8	0	7.8	0.3
LIB	355	2	5	1.8	1.3	353	0	5	0	8.5	1.2
LLB	22	5	36	4.0	1.2	22	0	32	0	16.7	-1.2
LOT	204	0	9	2.0	-0.8	196	1	9	0	10.0	0.2
LPR	49	4	20	2.4	0.9	49	0	18	0	9.6	3.5
LTU	641	0	4	1.6	-0.1	620	0	5	0	8.8	0.9
LXR	33	0	0	2.0	1.2	33	0	3	0	10.4	0.6
MAH	20	0	0	1.2	-0.4	20	0	0	0	7.5	-0.3
MAS	520	1	10	1.4	0.4	531	1	11	0	7.5	1.1
MON	100	0	5	2.0	-0.2	97	0	4	0	6.5	1.0
MPD	336	1	3	1.8	0.8	328	0	3	0	8.1	1.4
MPH	901	0	3	1.6	-0.5	898	0	4	0	8.2	0.8
NCA	685	0	2	1.8	0.4	680	0	3	0	8.0	0.6
NVR	109	0	1	1.5	0.4	111	0	4	0	8.4	1.2
NWA	9516	1	9	1.8	0.6	9400	0	9	0	8.6	0.7
PAC	316	8	100	2.8	0.9	333	0	24	0	9.6	0.8
PAL	976	1	4	1.6	-0.3	952	1	6	0	9.8	1.1
PAO	432	13	61	2.0	0.1	372	0	55	0	7.9	2.0
QFA	2150	0	57	1.6	0.2	2131	0	57	0	8.2	0.7
RAF	91	0	1	1.9	1.1	90	0	2	0	9.5	0.9
RAM	80	4	8	2.0	-0.7	82	0	4	0	9.1	1.0
RCH	359	4	17	2.0	0.2	342	0	15	0	10.4	2.0
RJA	45	0	0	1.4	-0.1	44	0	2	0	10.7	1.2
RKA	98	0	4	1.2	0.1	95	0	6	0	11.3	0.6
RRR	100	1	5	1.5	0.1	99	0	5	0	7.4	0.7
RYN	446	0	39	1.7	1.1	432	0	40	0	9.2	0.7
RZO	96	3	6	2.1	-0.3	95	0	4	0	9.9	1.5
SAA	260	1	4	1.6	0.0	252	0	4	0	9.5	1.0
SAB	48	0	0	1.1	0.3	50	0	4	0	7.9	-0.1
SAS	1678	0	24	1.6	-0.3	1665	0	24	0	7.8	0.4

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SIA	632	1	6	1.6	0.1	632	0	6	0	7.3	0.6
SKX	179	0	45	1.4	0.0	179	0	45	0	5.8	0.6
SLR	170	1	9	1.8	-0.8	172	0	10	0	7.6	0.9
SNB	98	49	63	5.3	3.4	98	0	8	0	11.3	-0.4
SOL	58	0	2	1.0	0.5	56	0	2	0	6.0	1.7
SVA	88	3	7	1.3	0.0	90	1	7	0	8.9	1.5
SVV	22	9	27	5.2	4.7	22	0	14	0	11.3	0.5
SWR	106	0	5	1.6	0.1	108	2	9	0	9.7	1.6
TAP	447	1	7	1.8	-0.3	443	1	7	0	10.1	2.0
THA	434	0	6	1.7	-0.4	435	1	9	0	9.8	1.0
THT	84	0	31	1.8	0.3	84	0	30	0	8.8	1.9
TOW	202	0	7	2.1	0.7	202	0	8	0	8.3	1.3
TPA	39	0	0	1.6	0.6	39	0	0	0	8.3	-0.4
TSC	32	3	6	1.9	0.5	29	0	3	0	7.4	-0.2
TWA	1783	1	9	1.8	0.4	1707	0	10	0	8.6	1.0
UAL	75893	0	86	1.2	-0.1	75869	0	86	0	6.2	0.7
UPS	1339	1	24	2.0	0.6	1341	0	24	0	7.9	0.6
USA	207	1	4	1.7	-0.2	175	0	4	0	8.9	1.2
VIR	754	1	2	1.8	-0.1	752	0	4	0	8.7	1.0
VKG	66	0	3	1.5	0.5	65	0	5	0	6.6	0.8
VPB	26	0	19	2.2	-0.1	26	0	15	0	6.9	0.8
VRG	123	2	20	2.5	1.0	130	1	17	0	8.8	3.0
VSP	54	0	20	1.8	0.8	53	0	21	0	7.9	2.1
VVR	41	24	49	3.3	1.0	47	0	34	0	8.3	2.3
WOA	279	1	7	1.5	0.5	289	0	8	0	9.1	0.9
AN	20015	0	20	1.4	0.5	20015	0	20	0	5.8	0.8
AR	3477	0	100	2.8	2.5	3465	0	6	0	6.8	1.5
BA	10276	0	8	1.4	0.7	10203	0	8	0	6.6	1.0
EU	78558	0	38	1.3	0.0	78558	0	37	0	5.9	0.7
KL	9793	0	11	1.4	0.8	9774	0	11	0	6.5	0.9
LH	2645	0	7	1.8	1.1	2628	0	7	0	6.1	1.1
LN	26	4	35	3.7	2.8	28	0	29	0	5.9	-2.1
MK	4706	0	42	1.5	1.1	4685	0	6	0	7.0	1.1
NZ	3368	0	8	1.2	0.0	3368	0	8	0	6.3	0.8
OZ	32	3	41	1.8	-0.4	32	3	41	0	9.2	0.9
QF	23431	0	13	1.3	0.6	23428	0	13	0	6.0	0.7
SA	3069	1	65	2.1	1.8	3070	0	4	0	6.8	0.8
SV	375	0	100	1.9	1.5	370	0	97	0	5.5	-0.1
WA	350	11	20	1.8	0.4	345	3	30	0	13.8	-4.0
XX	3365	2	8	1.5	0.3	3993	0	11	0	11.3	1.3
N	706	1	20	2.1	0.6	744	0	20	0	8.6	1.2
US ACARS	540462	0	49	1.2	0.3	540443	0	49	0	6.2	0.9

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA FIGURE 3
NOVEMBER 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED


0 1 0 4 0 0 2 2 0 1 0 1 0 0 0 0 0
0 1 1 3 0 8 6 13 8 13 6 7 3 1
9 12 40 8 7 6 4 4 18 41 92 118 128 97 66 66 38 70 12 10 10 7 5 1 1 1 0 2 3 3
20 26 24 66 123 81 45 36 16 11 29 58 115 206 236 253 265 613 703 829 71 36 17 10 1 6 8 2 2 0 2 3 3 13 24
17 51 54 57 83 766 1199 1651 1963 2707 1187 263 107 123 131 127 145 270 1772 228 115 25 14 19 31 5 2 2 2 2 0 3 75 71 129 55
4 11 9 35 171 915 2577 3328 3369 3275 534 45 48 78 70 24 21 46 28 30 32 42 8 13 37 34 0 3 3 12 5 98 86 65 35
4 61 270 185 52 13 13 62 169 607 235 97 65 46 17 10 7 0 14 13 14 2 10 4 10 29 44 2 1 46 21 20 20 10 18 16
0 6 9 13 8 0 0 6 25 53 39 47 28 5 3 12 2 0 11 9 13 8 0 4 8 3 16 11 37 1 2 3 1 2 2
6 11 12 7 4 0 0 0 0 0 52 7 11 0 11 6 0 8 5 12 18 0 6 1 2 7 28 4 0 2 2 0
35 42 10 7 0 31 9 13 3 13 1 0 0 6 1 17 8 10 0 5 1 1 1 25 39 15 5 0 0 1 12
54 13 8 0 13 11 9 18 4 0 0 0 4 3 16 1 6 14 3 1 0 0 2 31 62 56 25 2 9 42
28 13 1 0 0 0 0 3 15 22 20 0 0 7 11 8 7 6 4 3 3 3 3 22 37 79 110 109 99 66
9 2 4 3 20 0 1 2 6 0 0 1 0 0 0 25 29 53 334 231 133 31
2 1 1 0 0 0 0 0 0 0 1 1 0 0 5 9 43 36
0 1 0 0 0 1 0 0 0 0 0 0 0 0 1
0 1 1 1 1 0 1 0 0
0

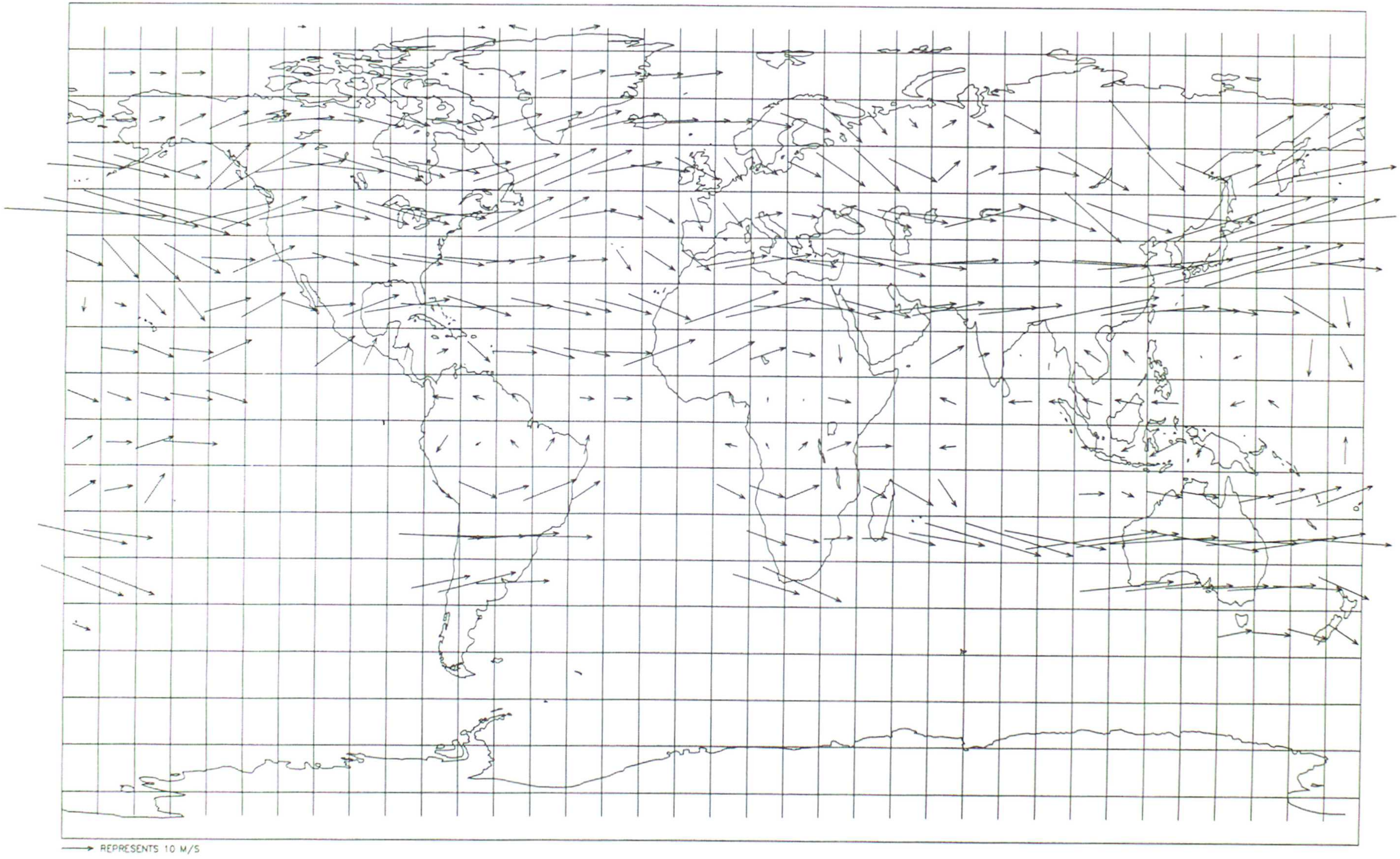
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

NOVEMBER 1999

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

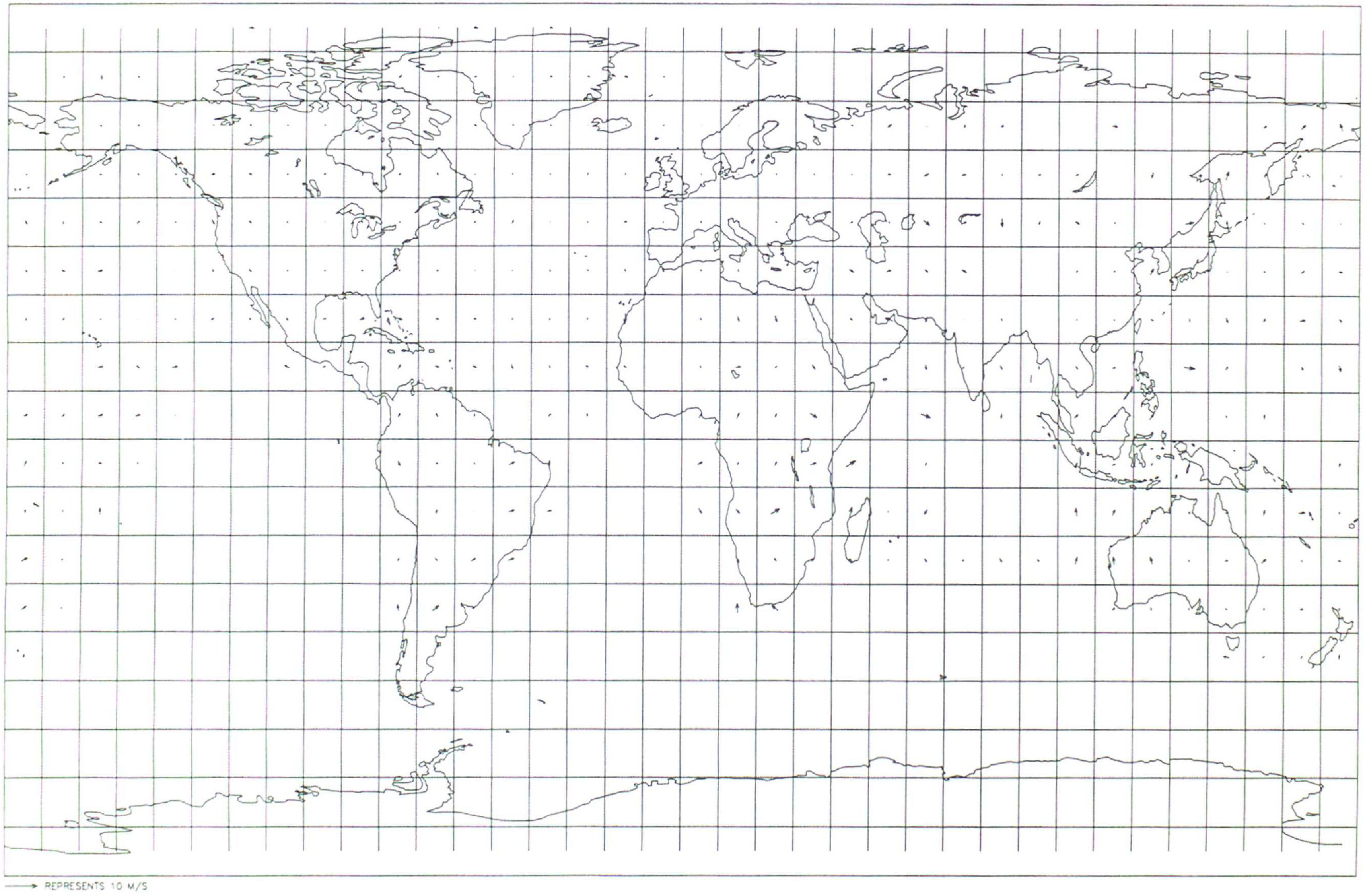
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4

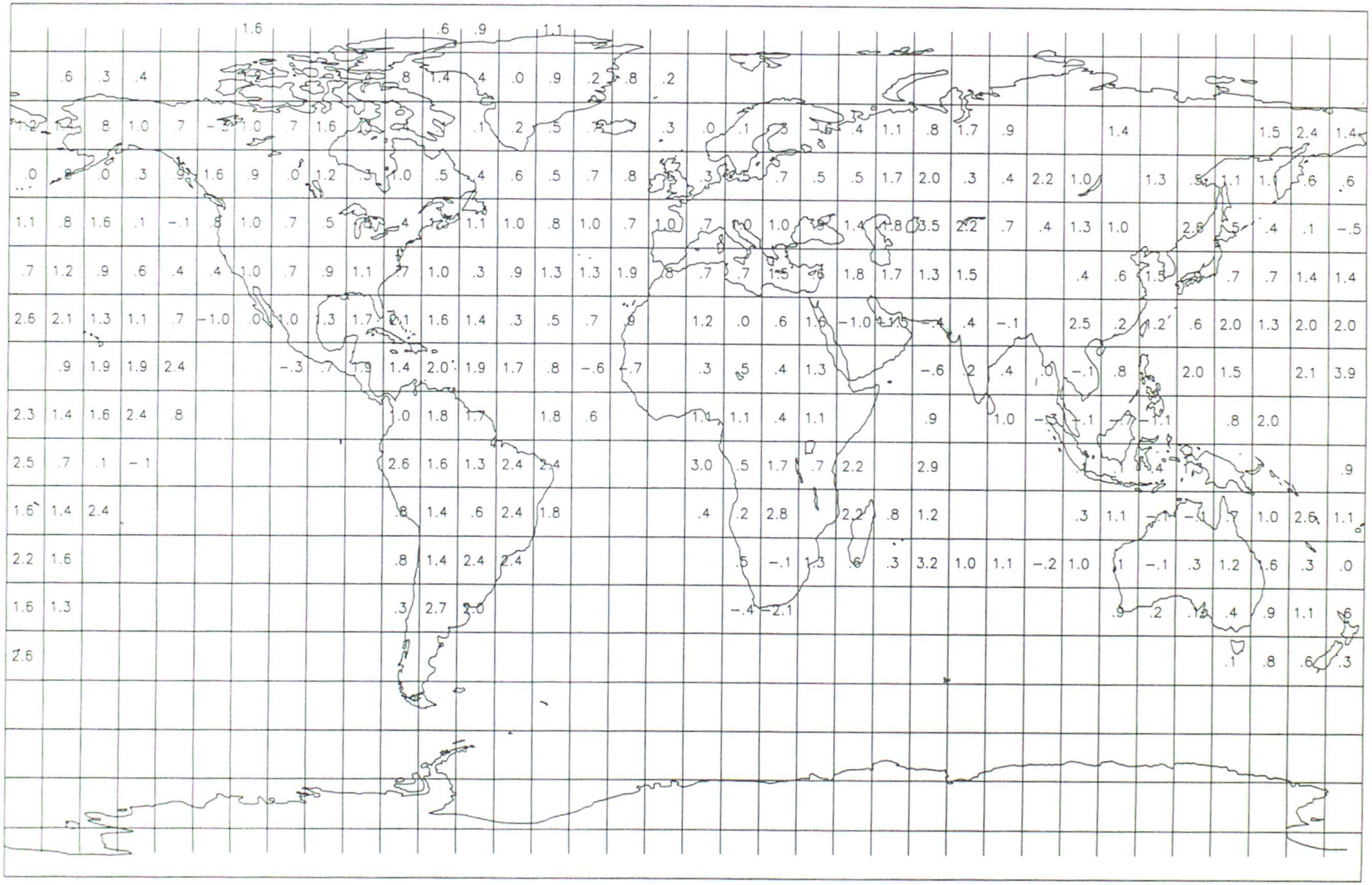


AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA
NOVEMBER 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 5



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
NOVEMBER 1999
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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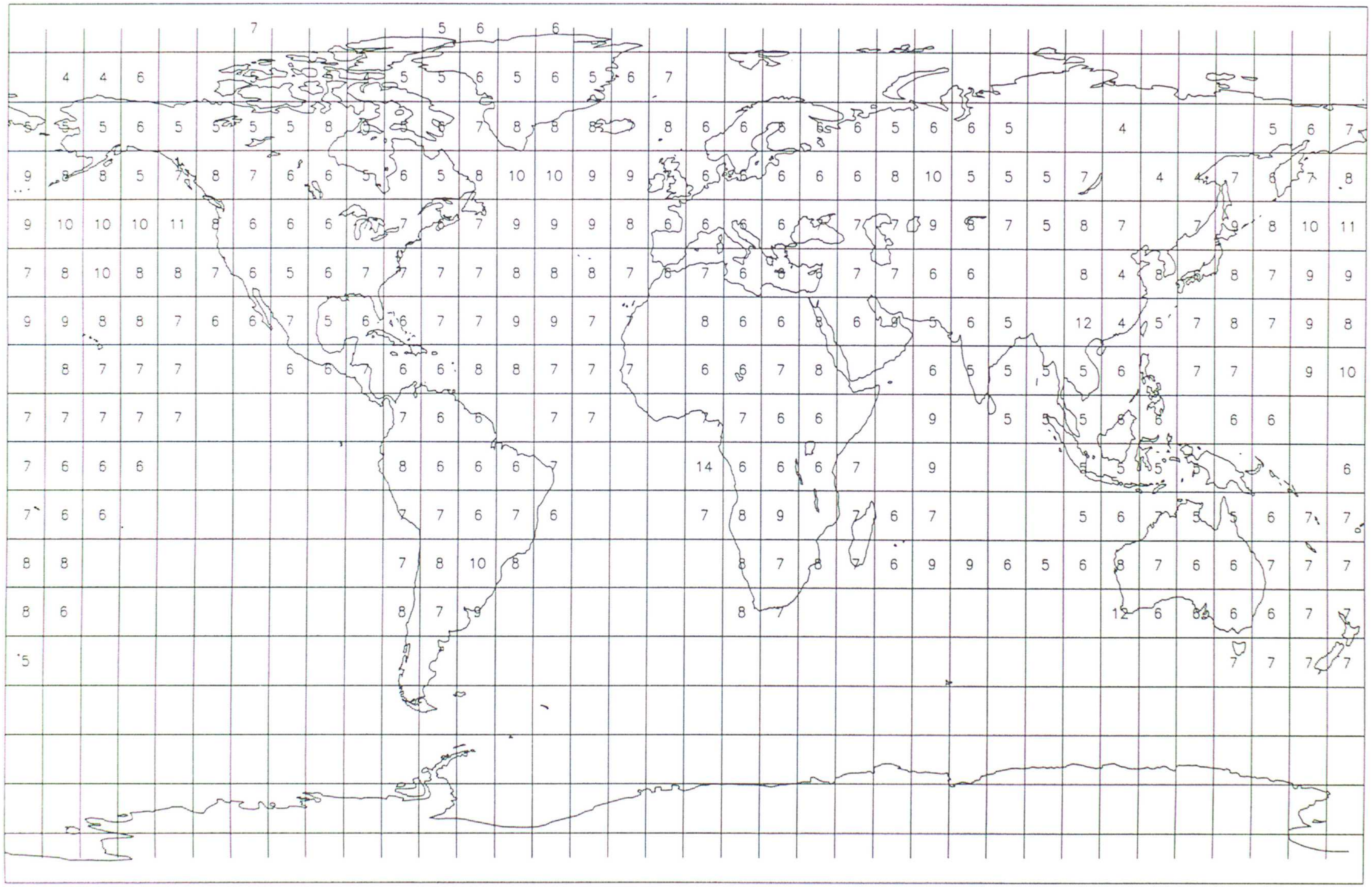
.6 .3 .4 .2 .8 1.4 .4 .0 .9 .2 .8 .2
1.2 1.2 .8 1.0 .7 −.3 1.0 .7 1.6 .1 .2 .5 .7 .3 .0 .1 .3 .6 .4 1.1 .8 1.7 .9 1.4 1.5 2.4 1.4
.0 .8 .0 .3 .9 1.6 .9 .0 1.2 .3 1.0 .5 .4 .6 .5 .7 .8 .6 .3 .5 .7 .5 .5 1.7 2.0 .3 .4 2.2 1.0 1.3 .5 1.1 1.1 .6 .6
1.1 .8 1.6 .1 −.1 .8 1.0 .7 .5 .4 1.1 1.0 .8 1.0 .7 1.0 .7 1.0 1.0 1.0 1.4 1.8 3.5 2.2 .7 .4 1.3 1.0 2.8 .5 .4 .1 −.5
.7 1.2 .9 .6 .4 .4 1.0 .7 .9 1.1 .7 1.0 .3 .9 1.3 1.3 1.9 .8 .7 .7 1.5 .6 1.8 1.7 1.3 1.5 .4 .6 1.5 .7 .7 1.4 1.4
2.6 2.1 1.3 1.1 .7 −1.0 .0 1.0 1.3 1.7 2.1 1.6 1.4 .3 .5 .7 .9 1.2 .0 .6 1.6 −1.0 −1.5 −.4 .4 −.1 2.5 .2 1.2 .6 2.0 1.3 2.0 2.0
.9 1.9 1.9 2.4 −.3 .7 .9 1.4 2.0 1.9 1.7 .8 −.6 −.7 .3 .5 .4 1.3 −.6 .2 .4 .0 −.1 .8 2.0 1.5 2.1 3.9
2.3 1.4 1.6 2.4 .8 1.0 1.8 1.7 1.8 .6 1.1 1.1 .4 1.1 .9 1.0 −.3 −.1 −.7 −1.1 .8 2.0
2.5 .7 .1 −.1 2.6 1.6 1.3 2.4 2.4 3.0 .5 1.7 .7 2.2 2.9 .4 .9
1.6 1.4 2.4 .8 1.4 .6 2.4 1.8 .4 .2 2.8 2.2 .8 1.2 .3 1.1 −.1 −.1 .7 1.0 2.6 1.1
2.2 1.6 .8 1.4 2.4 2.4 .5 −.1 1.3 .6 .3 3.2 1.0 1.1 −.2 1.0 .1 −.1 .3 1.2 .6 .3 .0
1.6 1.3 .3 2.7 2.0 −.4 −2.1 .9 .2 .1 .4 .9 1.1 .6
2.6 .1 .8 .6 .3

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
NOVEMBER 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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4 4 6 5 5 6 5 6 5 6 7
5 5 5 6 5 5 5 5 8 5 8 7 8 8 8 8 6 6 6 6 6 5 6 6 5 4 5 6 7
9 8 8 5 7 8 7 6 6 5 6 5 8 10 10 9 9 6 6 6 6 6 8 10 5 5 5 7 4 4 7 6 7 8
9 10 10 10 11 8 6 6 6 7 8 7 9 9 9 8 6 6 6 6 7 7 9 8 7 5 8 7 7 9 8 10 11
7 8 10 8 8 7 6 5 6 7 7 7 7 8 8 8 7 6 7 6 8 6 7 7 6 6 8 4 8 8 7 9 9
9 9 8 8 7 6 6 7 5 6 6 7 7 9 9 7 7 8 6 6 8 6 9 5 6 5 12 4 5 7 8 7 9 8
8 7 7 7 6 6 6 6 8 8 7 7 7 6 6 7 8 6 5 5 5 5 6 7 7 9 10
7 7 7 7 7 7 6 6 7 7 7 6 6 9 5 5 5 8 6 6 6
7 6 6 6 8 6 6 6 7 14 6 6 6 7 9 5 5 5 6
7 6 6 7 7 6 7 6 7 8 9 7 6 7 5 6 7 5 5 6 7 7
8 8 7 8 10 8 8 7 8 7 6 9 9 6 5 6 8 7 6 6 7 7 7
8 6 8 7 9 8 7 12 6 6 6 6 7 7
5 7 7 7 7

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

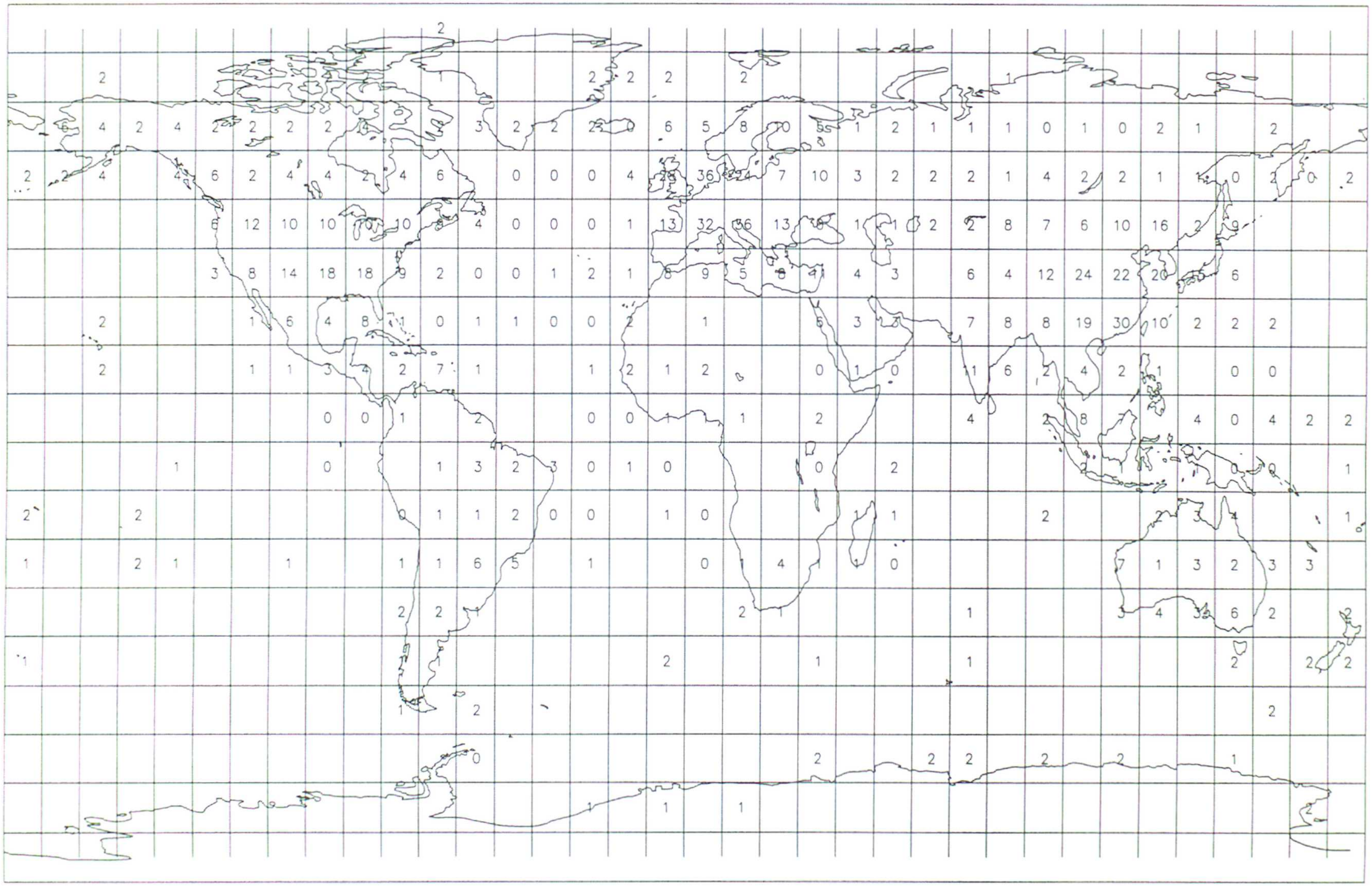
WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
33317	00	Z	200	50/ 27	27	0	21.2	80.8	83.5	4
42314	12	Z	150	27/ 95	19	0	43.4	-96.8	106.1	5
42339	00	Z	400	26/ 73	14	0	66.5	4.7	66.7	5
42361	00	Z	100	26/ 78	13	1	101.6	124.3	160.6	6
42369	12	Z	150	27/ 81	20	0	80.3	-45.1	92.1	4
42410	12	Z	100	26/ 92	18	1	78.0	-87.9	117.5	5
42647	00	Z	250	23/ 73	11	0	82.2	15.0	83.6	4
43003	12	Z	200	19/ 73	8	3	49.6	197.6	203.8	5
43128	12	Z	100	17/ 78	23	0	65.9	155.4	168.8	4
43279	00	Z	200	13/ 80	25	0	80.6	-21.4	83.4	4
43311	00	Z	150	11/ 73	10	0	131.1	47.1	139.3	4
43369	00	Z	200	8/ 73	18	0	75.5	-74.3	106.0	6
47881	00	Z	150	34/ 135	10	0	100.0	31.1	104.8	6
56739	00	Z	1000	25/ 98	11	18	5.9	84.5	84.7	4
83612	00	Z	100	-20/ -55	23	0	47.4	118.4	127.6	7
89022	12	Z	100	-75/ -27	21	0	28.6	120.0	123.4	6
89512	12	Z	200	-71/ 12	12	0	28.9	71.3	76.9	4
97372	00	Z	200	-10/ 124	10	0	71.3	91.4	115.9	7

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – NOVEMBER 1999 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1116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6 4 2 4 2 2 2 2 4 3 2 2 2 0 6 5 8 10 5 1 2 1 1 1 0 1 0 2 1 2
2 2 4 4 6 2 4 4 2 4 6 0 0 0 4 28 36 24 7 10 3 2 2 2 1 4 2 2 1 1 0 2 0 2
6 12 10 10 10 10 8 4 0 0 0 1 13 32 36 13 8 1 1 0 2 2 8 7 6 10 16 2 9
3 8 14 18 18 9 2 0 0 1 2 1 8 9 5 8 4 4 3 6 4 12 24 22 20 6
2 1 6 4 8 1 0 1 1 0 0 2 1 5 3 2 7 8 8 19 30 10 2 2 2
2 1 1 3 4 2 7 1 1 2 1 2 0 1 0 11 6 2 4 2 1 0 0
0 0 1 2 0 0 1 1 2 4 2 8 7 4 0 4 2 2
1 0 1 3 2 3 0 1 0 0 2 2 1 0 0 1
2 2 0 1 1 2 0 0 1 0 1 1 2 2 3 4 1
1 2 1 1 1 1 6 5 1 0 1 4 1 1 0 7 1 3 2 3 3
2 2 1 2 1 1 3 4 3 6 2 2
1 1 2 1 1 2 2 2
1 2 2
0 2 2 2 2 2 1
1 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
40875	12	V	250	27/ 56	11	0	9	-4.7	-8.6	15.2	1
42361	00	V	200	26/ 78	10	0	20	14.6	15.2	21.1	2
42410	00	V	150	26/ 92	17	0	23	9.6	4.5	22.4	5
42410	12	V	300	26/ 92	17	0	41	-0.2	7.7	20.4	3
67197	12	V	300	-25/ 47	11	0	9	2.8	4.9	15.9	1
78486	12	V	250	18/ -70	21	1	40	3.0	-12.6	19.4	2

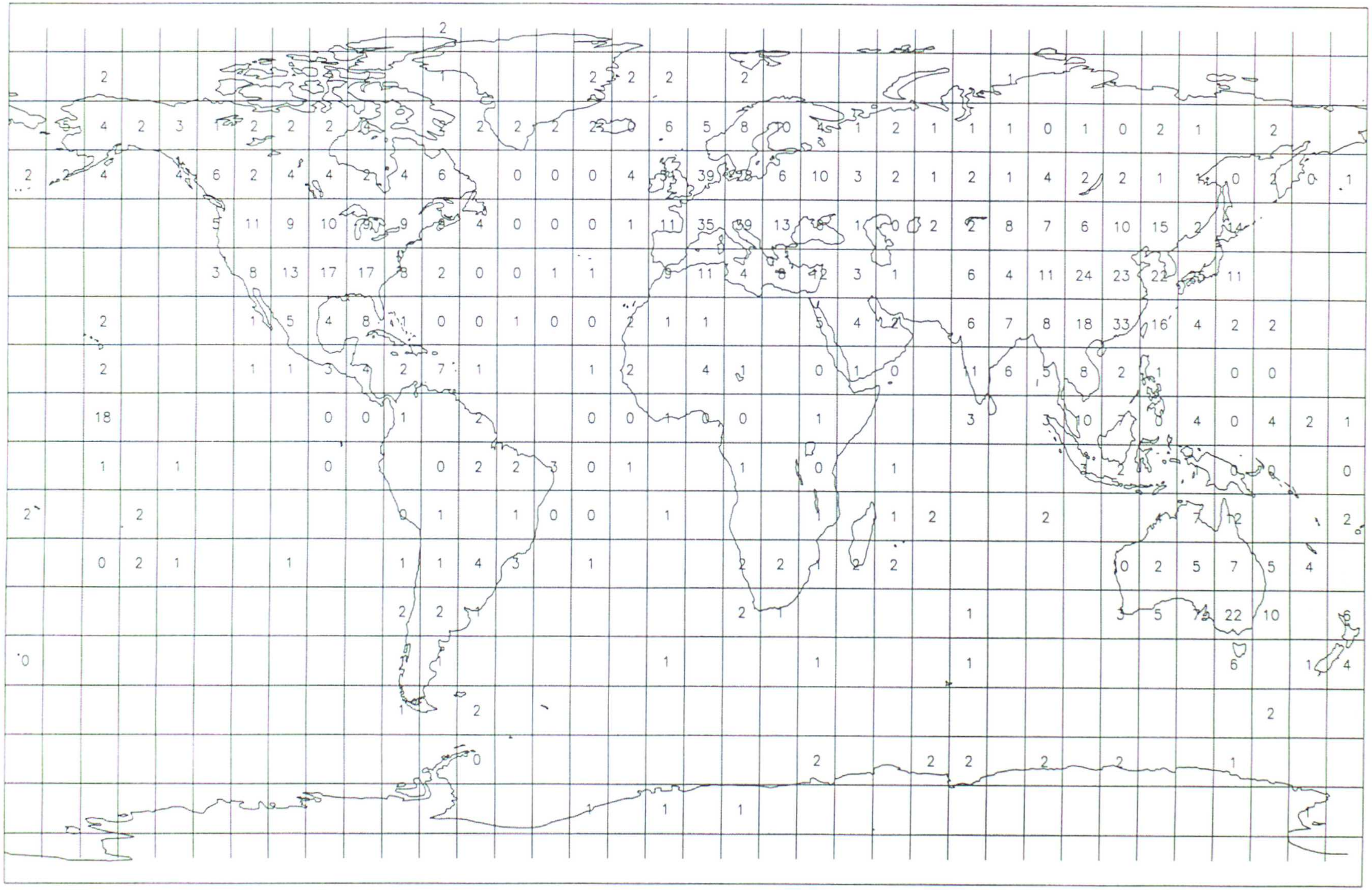
AVAILABILITY – TEMP/PILOT – 300 HPA WIND – NOVEMBER 1999

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1243

FIGURE 9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4 2 3 1 2 2 2 2 2 2 2 6 5 8 10 1 2 1 1 1 0 1 0 2 1 2
2 2 4 4 6 2 4 4 2 4 6 0 0 0 4 3 39 28 6 10 3 2 1 2 1 4 2 2 1 1 0 2 0 1
5 11 9 10 9 9 8 4 0 0 0 1 11 35 39 13 10 1 0 0 2 2 8 7 6 10 15 2 14
3 8 13 17 17 8 2 0 0 1 1 9 11 4 8 12 3 1 6 4 11 24 23 22 5 11
2 1 5 4 8 1 0 0 1 0 0 2 1 1 5 4 2 6 7 8 18 33 16 4 2 2
2 1 1 3 4 2 7 1 1 2 4 1 0 1 0 1 6 5 8 2 1 0 0
18 0 0 1 2 0 0 1 0 0 1 3 3 10 7 0 4 0 4 2 1
1 1 0 0 2 2 3 0 1 1 0 1 3 2 0 0 0
2 2 0 1 1 0 0 1 1 1 2 2 7 12 2
0 2 1 1 1 1 4 3 1 2 2 1 2 2 0 2 5 7 5 4
2 2 1 2 1 1 3 5 7 22 10 6
0 1 1 1 1 6 1 4
1 2 2
0 2 2 2 2 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
08594	12	DD	17/ -23	19	-11.3	4.8	13.2
17240	12	DD	38/ 31	24	-12.7	6.7	12.8
17280	00	DD	38/ 40	24	-10.9	4.9	10.7
17280	12	DD	38/ 40	27	-12.9	4.1	12.3
42361	00	DD	26/ 78	14	-15.1	9.7	12.7
43150	12	DD	18/ 83	16	10.5	9.5	20.4
43371	12	DD	8/ 77	14	10.8	6.3	17.6
62337	12	DD	31/ 34	26	-18.9	1.3	5.8
87715	12	DD	-39/ -68	8	-13.3	8.8	17.7

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: NOVEMBER 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

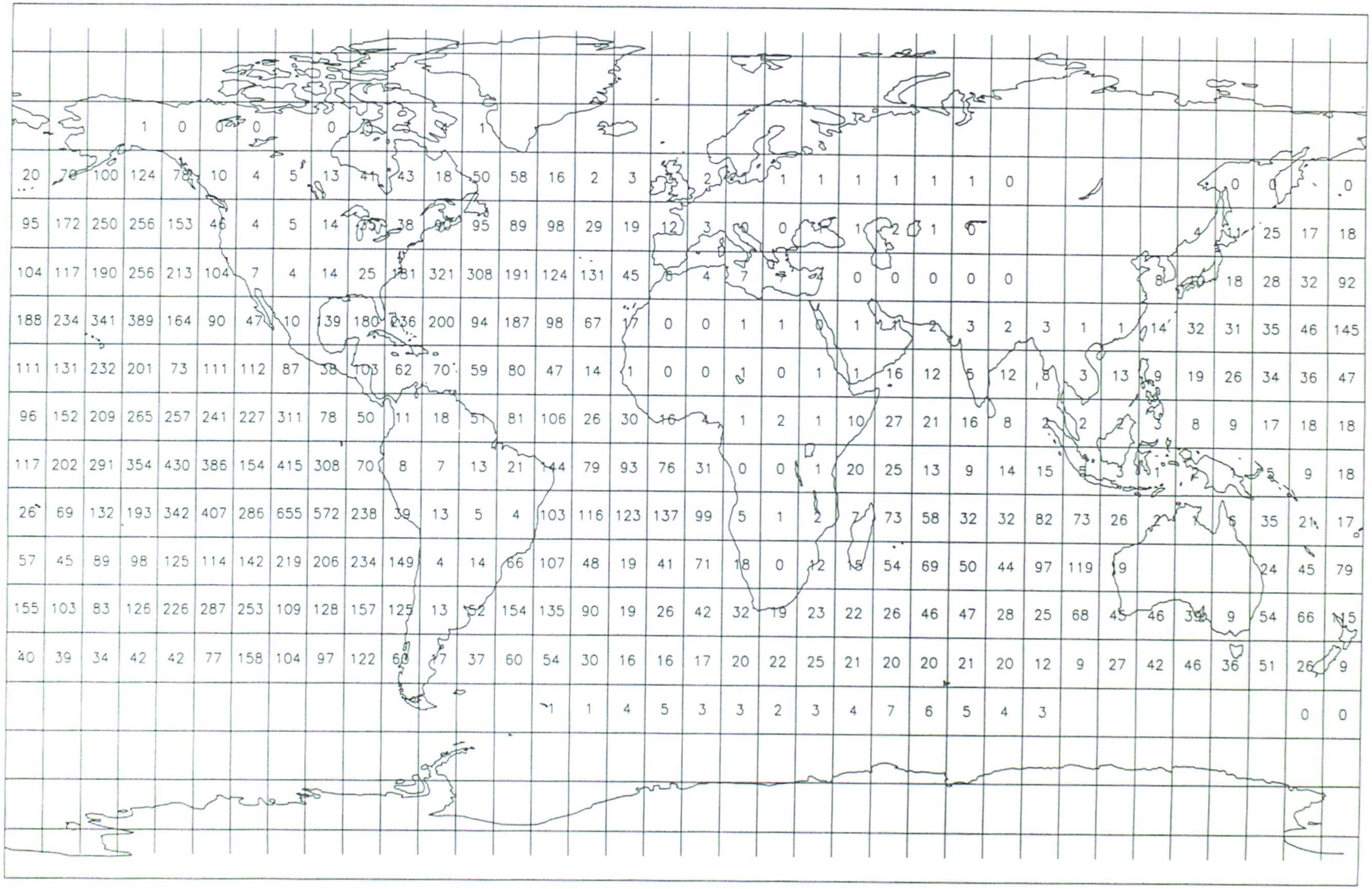
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
NOVEMBER 1999


1 0 0 0 0 1
20 78 100 124 78 10 4 5 13 41 43 18 50 58 16 2 3 2 1 1 1 1 1 1 0 0 0 0
95 172 250 256 153 46 4 5 14 35 38 90 95 89 98 29 19 12 3 0 0 1 1 2 1 0 4 11 25 17 18
104 117 190 256 213 104 7 4 14 25 181 321 308 191 124 131 45 6 4 7 7 4 0 0 0 0 0 8 30 18 28 32 92
188 234 341 389 164 90 47 10 139 180 236 200 94 187 98 67 17 0 0 1 1 0 1 1 2 3 2 3 1 1 14 32 31 35 46 145
111 131 232 201 73 111 112 87 38 103 62 70 59 80 47 14 1 0 0 1 0 1 1 16 12 5 12 8 3 13 9 19 26 34 36 47
96 152 209 265 257 241 227 311 78 50 11 18 51 81 106 26 30 16 4 1 2 1 10 27 21 16 8 2 2 2 3 8 9 17 18 18
117 202 291 354 430 386 154 415 308 70 8 7 13 21 44 79 93 76 31 0 0 1 20 25 13 9 14 15 5 3 1 2 5 9 18
26 69 132 193 342 407 286 655 572 238 39 13 5 4 103 116 123 137 99 5 1 2 7 73 58 32 32 82 73 26 2 1 6 35 21 17
57 45 89 98 125 114 142 219 206 234 149 4 14 66 107 48 19 41 71 18 0 12 15 54 69 50 44 97 119 19 24 45 79
155 103 83 126 226 287 253 109 128 157 125 13 52 154 135 90 19 26 42 32 19 23 22 26 46 47 28 25 68 45 46 39 9 54 66 15
40 39 34 42 42 77 158 104 97 122 60 17 37 60 54 30 16 16 17 20 22 25 21 20 20 21 20 12 9 27 42 46 36 51 26 9
1 1 4 5 3 3 2 3 4 7 6 5 4 3 0 0

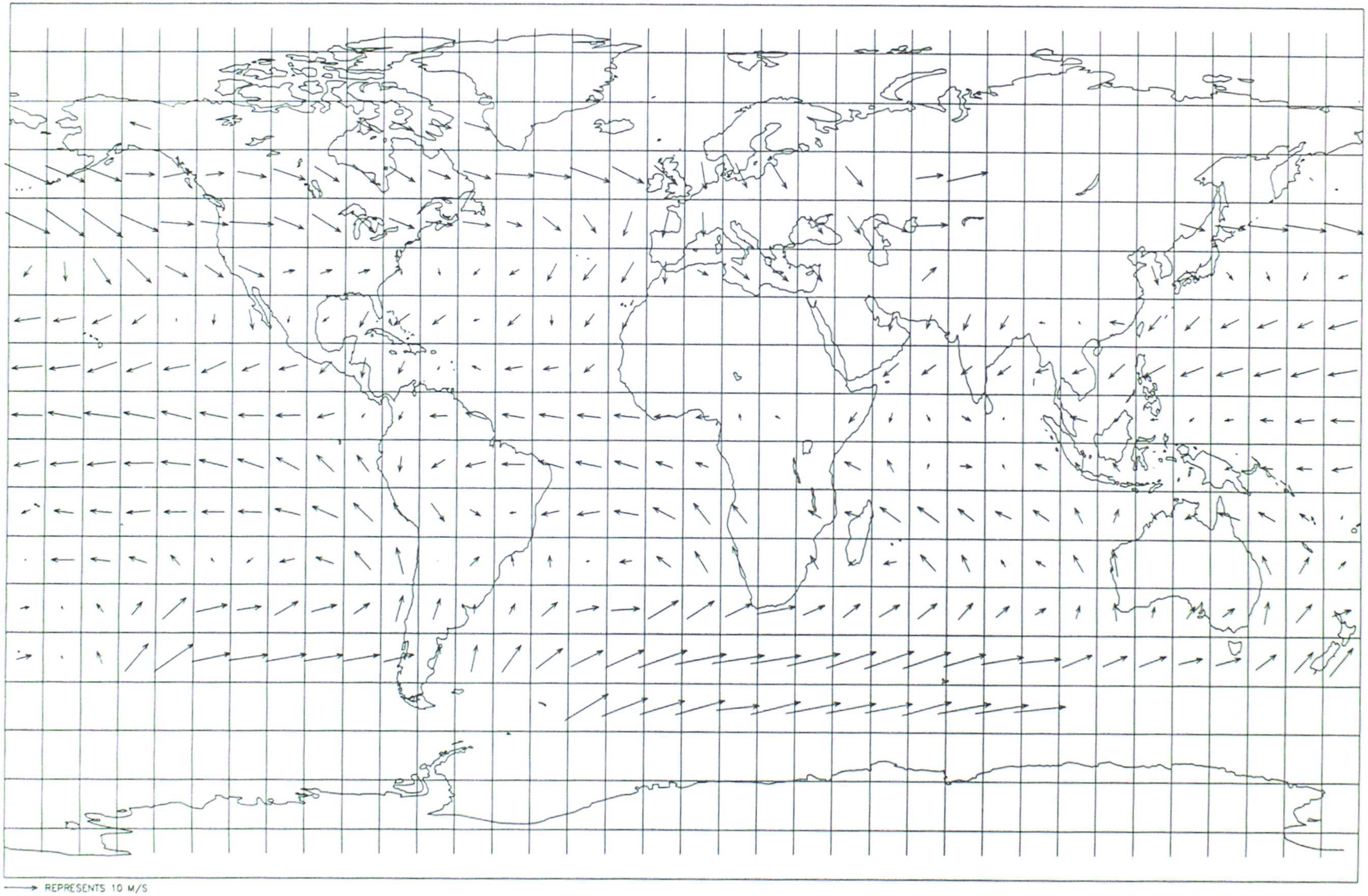
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

NOVEMBER 1999

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


→ REPRESENTS 10 M/S

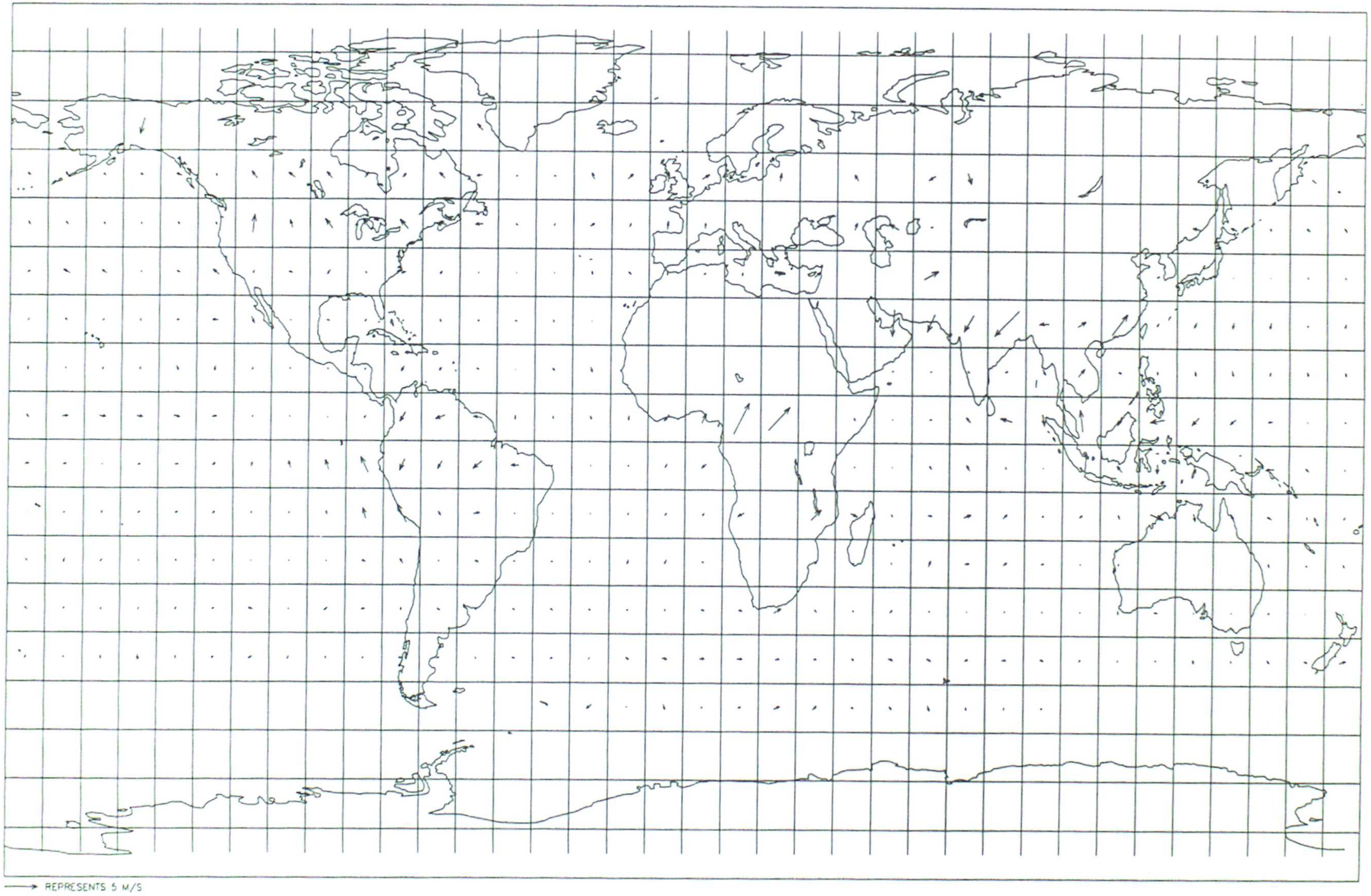
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

NOVEMBER 1999

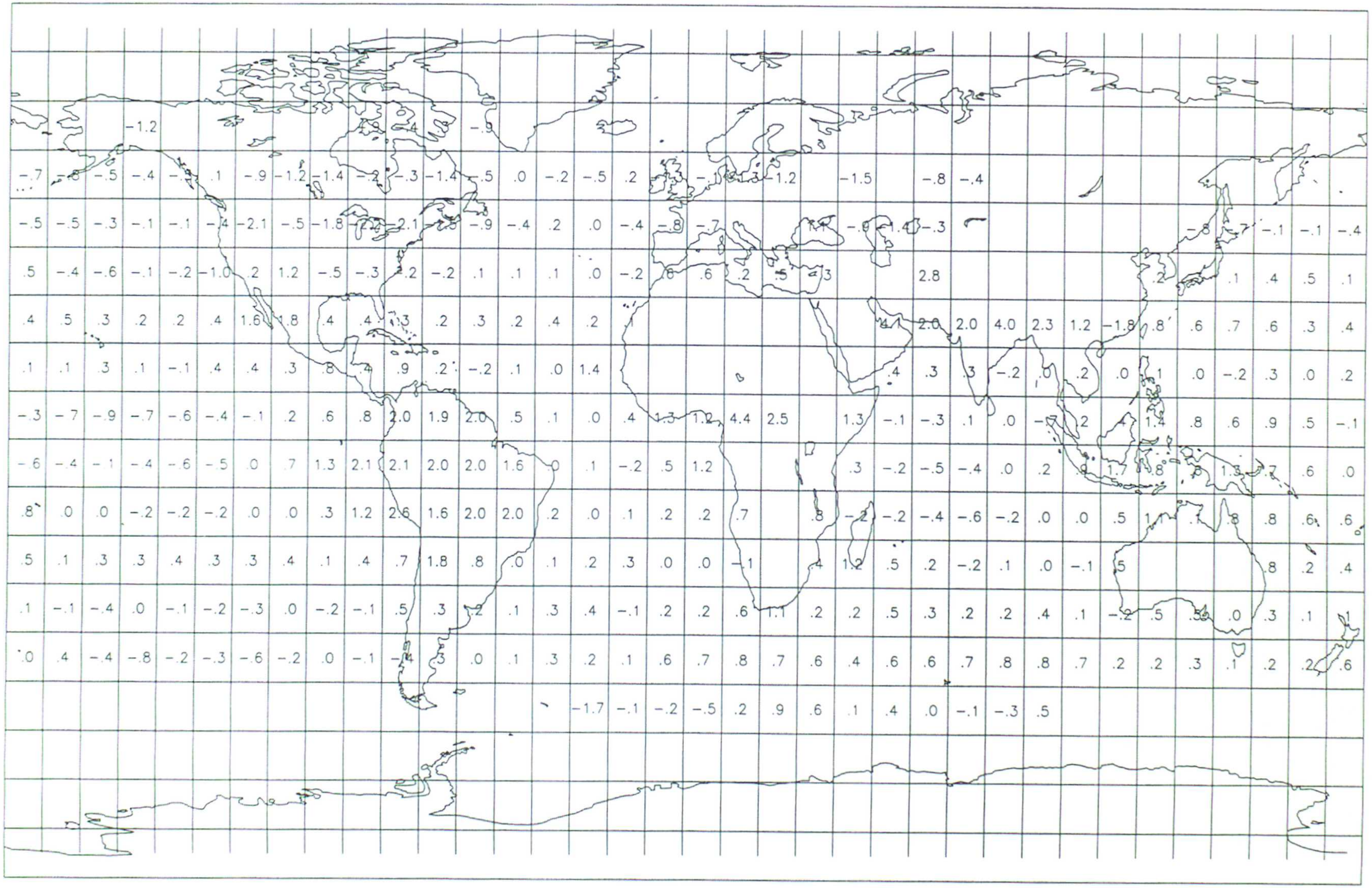
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

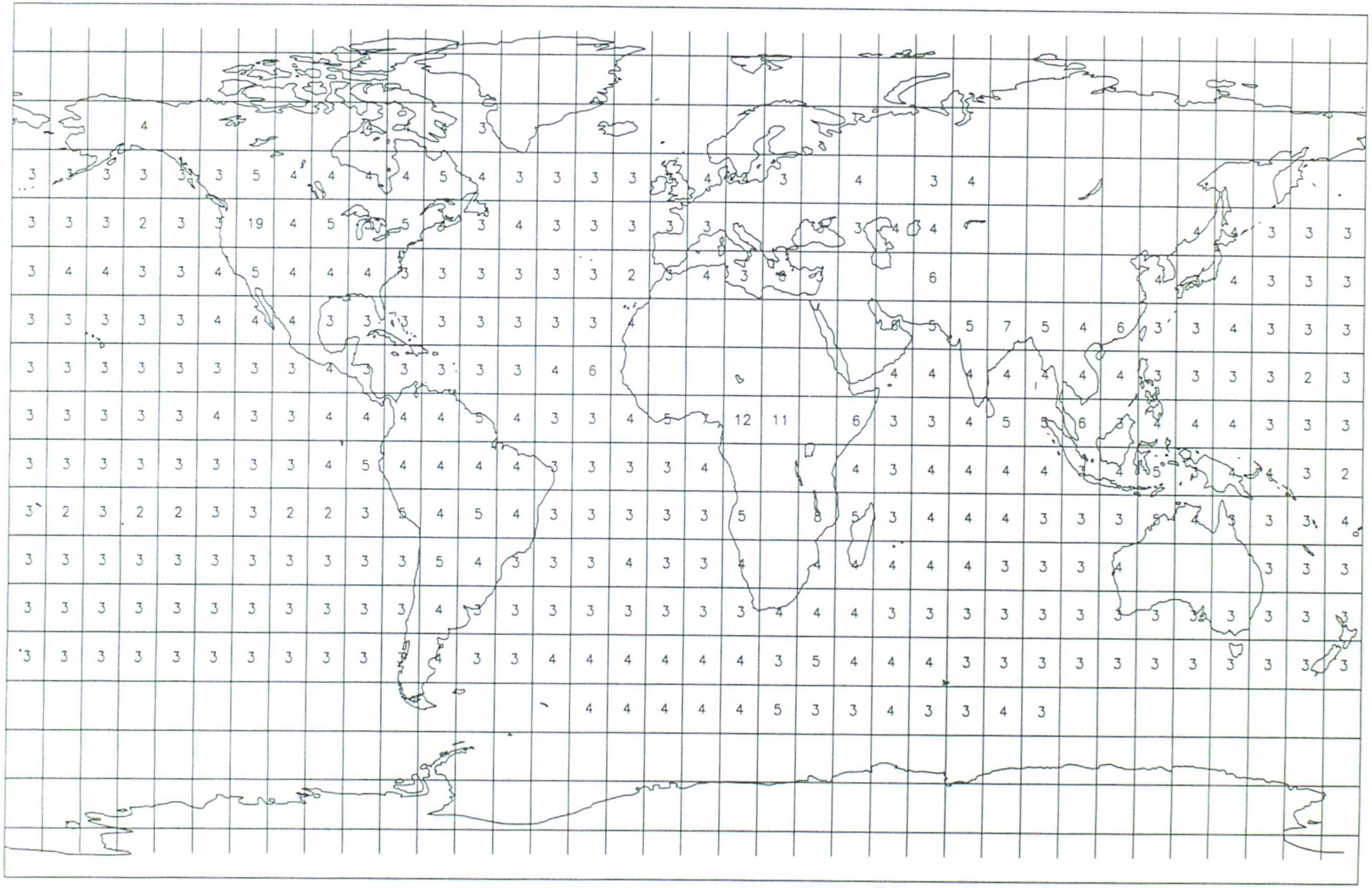
FIGURE 12



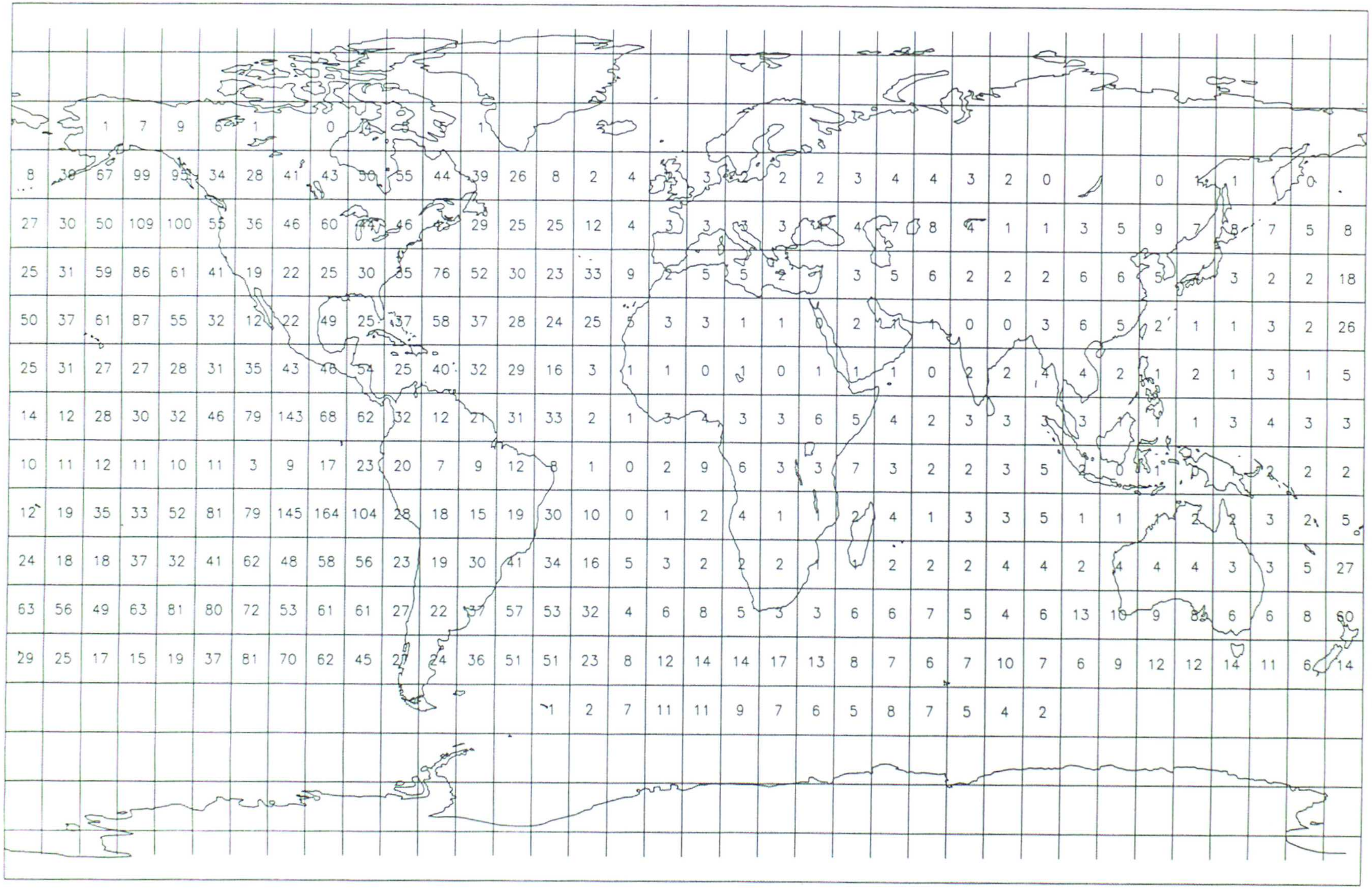
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
NOVEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.2 .4 -.9
-.7 -.8 -.5 -.4 -.3 .1 -.9 -1.2 -1.4 -.2 -.3 -1.4 -.5 .0 -.2 -.5 .2 -.1 -1.3 -1.2 -1.5 -.8 -.4
-.5 -.5 -.3 -.1 -.1 -.4 -2.1 -.5 -1.8 -2.2 -2.1 -2.5 -.9 -.4 .2 .0 -.4 -.8 -.7 1.1 -.9 -1.4 -.3 -.8 -.7 -.1 -.1 -.4
.5 -.4 -.6 -.1 -.2 -1.0 .2 1.2 -.5 -.3 .2 -.2 .1 .1 .1 .0 -.2 .6 .6 .2 .5 .3 2.8 .2 .1 .4 .5 .1
.4 .5 .3 .2 .2 .4 1.6 1.8 .4 .4 .3 .2 .3 .2 .4 .2 .1 4.1 2.0 2.0 4.0 2.3 1.2 -1.8 .8 .6 .7 .6 .3 .4
.1 .1 .3 .1 -.1 .4 .4 .3 .8 .4 .9 .2 -.2 .1 .0 1.4 .4 .3 .3 -.2 .0 .2 .0 .1 .0 -.2 .3 .0 .2
-.3 -.7 -.9 -.7 -.6 -.4 -.1 .2 .6 .8 2.0 1.9 2.0 .5 .1 .0 .4 1.3 1.2 4.4 2.5 1.3 -.1 -.3 .1 .0 -.7 .2 .4 1.4 .8 .6 .9 .5 -.1
-.6 -.4 -.1 -.4 -.6 -.5 .0 .7 1.3 2.1 2.1 2.0 2.0 1.6 .0 .1 -.2 .5 1.2 .3 -.2 -.5 -.4 .0 .2 .9 1.7 .8 .5 1.3 .7 .6 .0
.8 .0 .0 -.2 -.2 -.2 .0 .0 .3 1.2 2.6 1.6 2.0 2.0 .2 .0 .1 .2 .2 .7 .8 -.2 -.2 -.4 -.6 -.2 .0 .0 .5 1.1 .1 .8 .8 .6 .6
.5 .1 .3 .3 .4 .3 .3 .4 .1 .4 .7 1.8 .8 .0 .1 .2 .3 .0 .0 -.1 .4 1.2 .5 .2 -.2 .1 .0 -.1 .5 .8 .2 .4
.1 -.1 -.4 .0 -.1 -.2 -.3 .0 -.2 -.1 .5 .3 .2 .1 .3 .4 -.1 .2 .2 .6 1.1 .2 .2 .5 .3 .2 .2 .4 .1 -.2 .5 .5 .0 .3 .1 .1
.0 .4 -.4 -.8 -.2 -.3 -.6 -.2 .0 -.1 -.4 .3 .0 .1 .3 .2 .1 .6 .7 .8 .7 .6 .4 .6 .6 .7 .8 .8 .7 .2 .2 .3 .1 .2 .2 .6
-1.7 -.1 -.2 -.5 .2 .9 .6 .1 .4 .0 -.1 -.3 .5

SATOBS : RMS O−B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
NOVEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

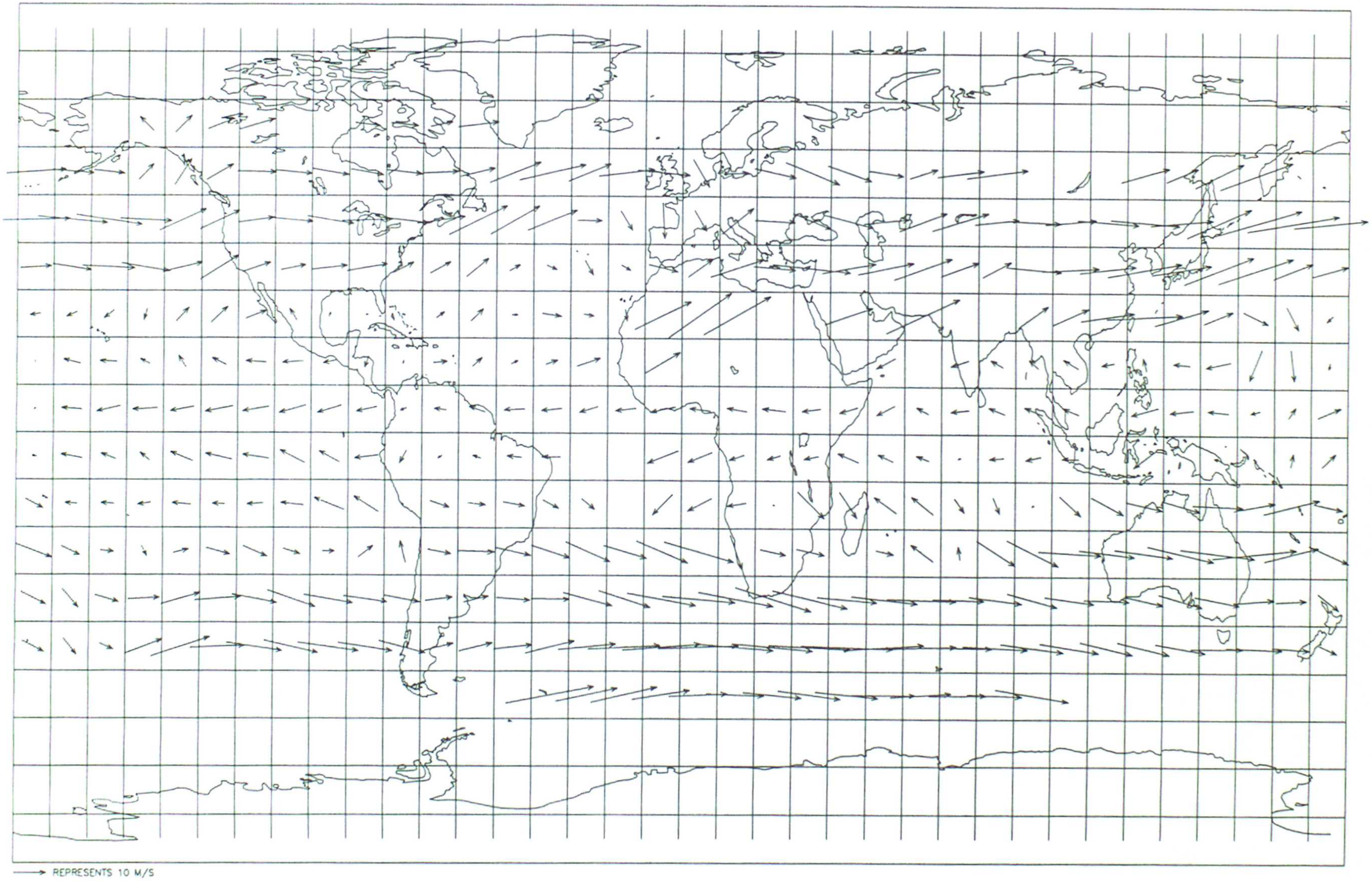

4 3
3 3 3 3 3 3 5 4 4 4 4 5 4 3 3 3 3 3 4 3 4 3 4
3 3 3 2 3 3 19 4 5 5 5 4 3 4 3 3 3 3 3 3 4 4 4 4 3 3 3
3 4 4 3 3 4 5 4 4 4 3 3 3 3 3 3 2 3 4 3 8 3 6 4 4 3 3 3
3 3 3 3 3 4 4 4 3 3 3 3 3 3 3 3 4 8 5 5 7 5 4 6 3 3 4 3 3 3
3 3 3 3 3 3 3 3 4 3 3 3 3 3 4 6 4 4 4 4 4 4 4 3 3 3 3 2 3
3 3 3 3 3 4 3 3 4 4 4 4 5 4 3 3 4 5 7 12 11 6 3 3 4 5 5 6 3 4 4 4 3 3 3
3 3 3 3 3 3 3 3 4 5 4 4 4 4 3 3 3 3 4 4 3 4 4 4 4 3 4 5 3 4 4 3 2
3 2 3 2 2 3 3 2 2 3 5 4 5 4 3 3 3 3 3 5 8 5 3 4 4 4 3 3 3 5 4 3 3 3 4
3 3 3 3 3 3 3 3 3 3 3 5 4 3 3 3 4 3 3 4 4 4 4 4 4 3 3 3 4 3 3 3
3 3 3 3 3 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 4 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3 4 3 3 4 4 4 4 4 4 3 5 4 4 4 3 3 3 3 3 3 3 3 3 3 3
4 4 4 4 4 5 3 3 4 3 3 4 3

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
NOVEMBER 1999


1 7 9 6 1 0 4 5 1
8 30 67 99 95 34 28 41 43 50 55 44 39 26 8 2 4 2 3 2 2 2 3 4 4 3 2 0 0 1 1 1 0
27 30 50 109 100 55 36 46 60 44 46 45 29 25 25 12 4 3 3 3 3 4 4 7 8 4 1 1 3 5 9 7 8 7 5 8
25 31 59 86 61 41 19 22 25 30 35 76 52 30 23 33 9 2 5 5 2 1 3 5 6 2 2 2 6 6 5 3 2 2 18
50 37 61 87 55 32 12 22 49 25 37 58 37 28 24 25 5 3 3 1 1 0 2 1 1 0 0 3 6 5 2 1 1 3 2 26
25 31 27 27 28 31 35 43 46 54 25 40 32 29 16 3 1 1 0 1 0 1 1 1 0 2 2 4 4 2 1 2 1 3 1 5
14 12 28 30 32 46 79 143 68 62 32 12 21 31 33 2 1 3 4 3 3 6 5 4 2 3 3 3 3 1 1 1 3 4 3 3
10 11 12 11 10 11 3 9 17 23 20 7 9 12 8 1 0 2 9 6 3 3 7 3 2 2 3 5 2 0 1 0 1 2 2 2
12 19 35 33 52 81 79 145 164 104 28 18 15 19 30 10 0 1 2 4 1 1 2 4 1 3 3 5 1 1 1 2 2 3 2 5
24 18 18 37 32 41 62 48 58 56 23 19 30 41 34 16 5 3 2 2 2 1 1 2 2 2 4 4 2 4 4 4 3 3 5 27
63 56 49 63 81 80 72 53 61 61 27 22 37 57 53 32 4 6 8 5 3 3 6 6 7 5 4 6 13 10 9 83 6 6 8 60
29 25 17 15 19 37 81 70 62 45 27 24 36 51 51 23 8 12 14 14 17 13 8 7 6 7 10 7 6 9 12 12 14 11 6 14
1 2 7 11 11 9 7 6 5 8 7 5 4 2

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
NOVEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


→ REPRESENTS 10 M/S

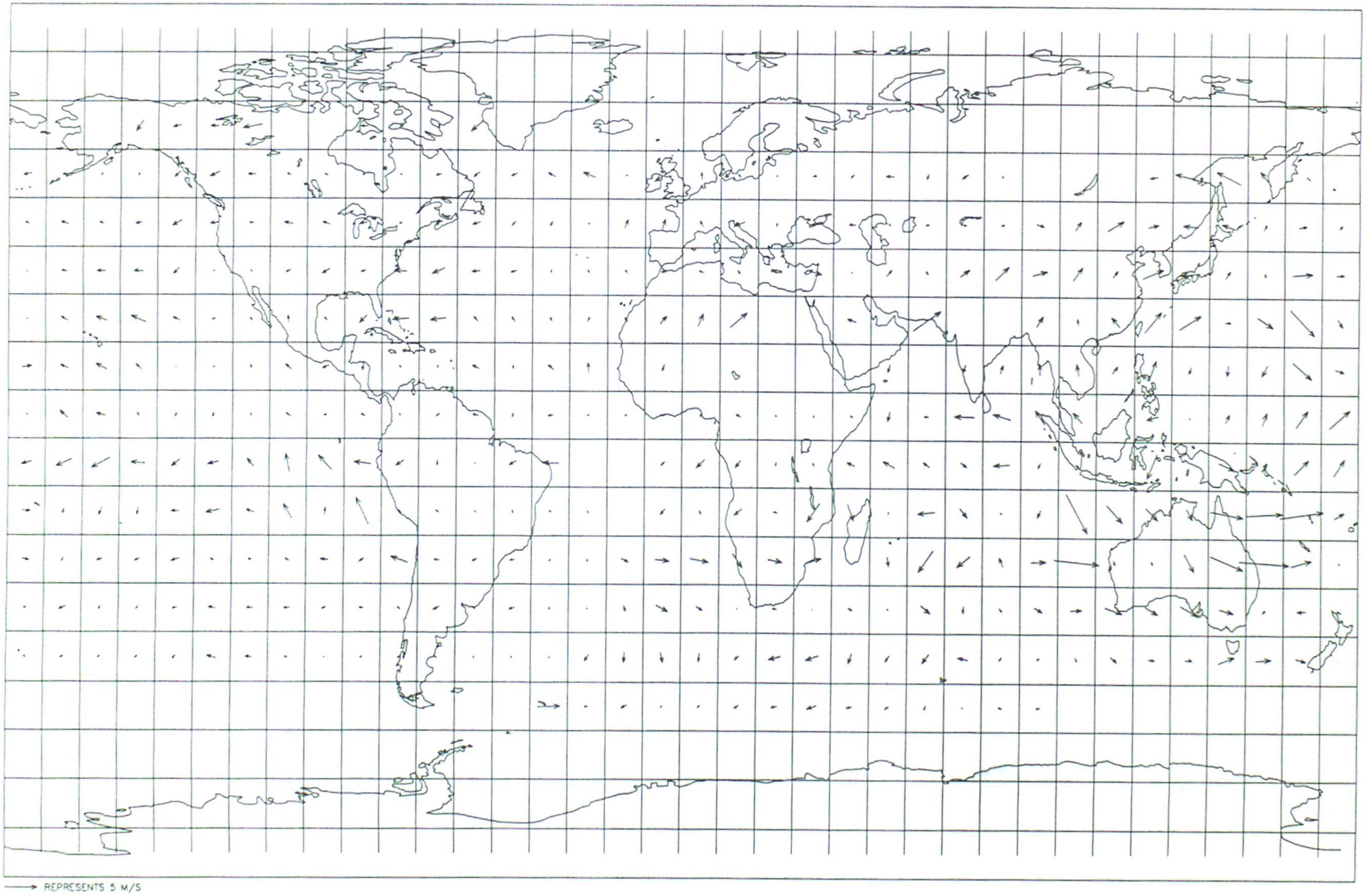
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 401–700 HPA

NOVEMBER 1999

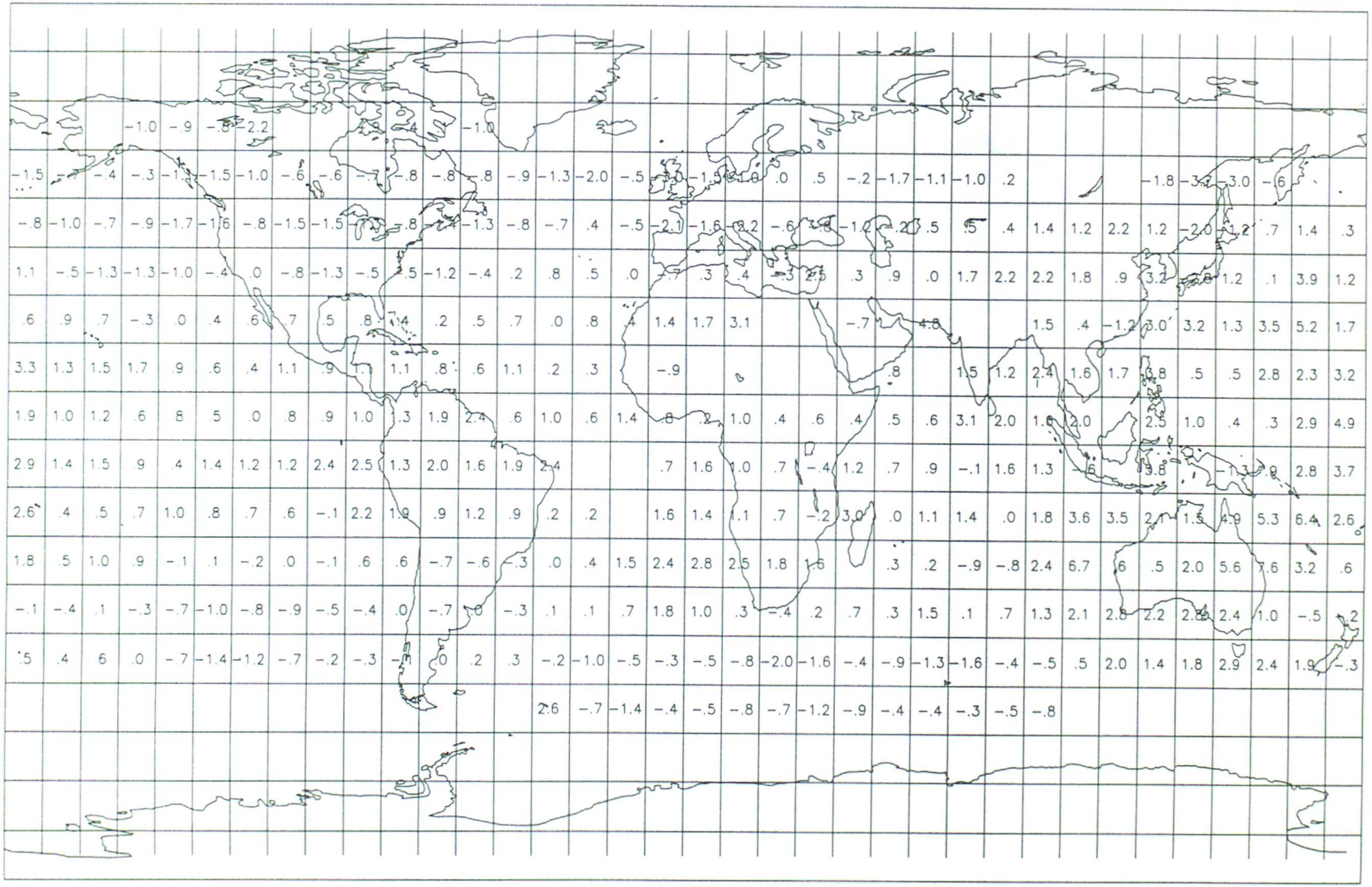
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

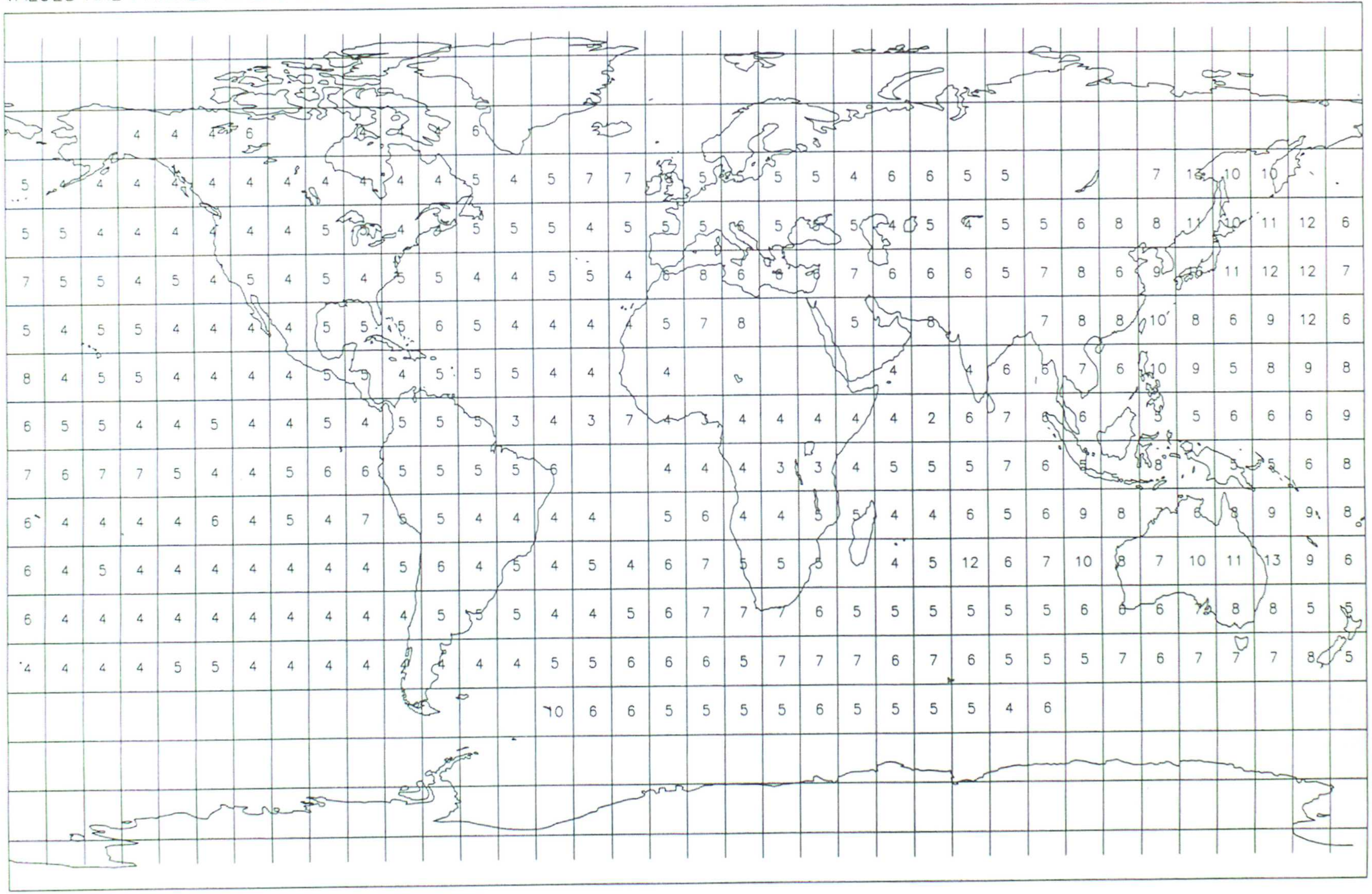
FIGURE 17



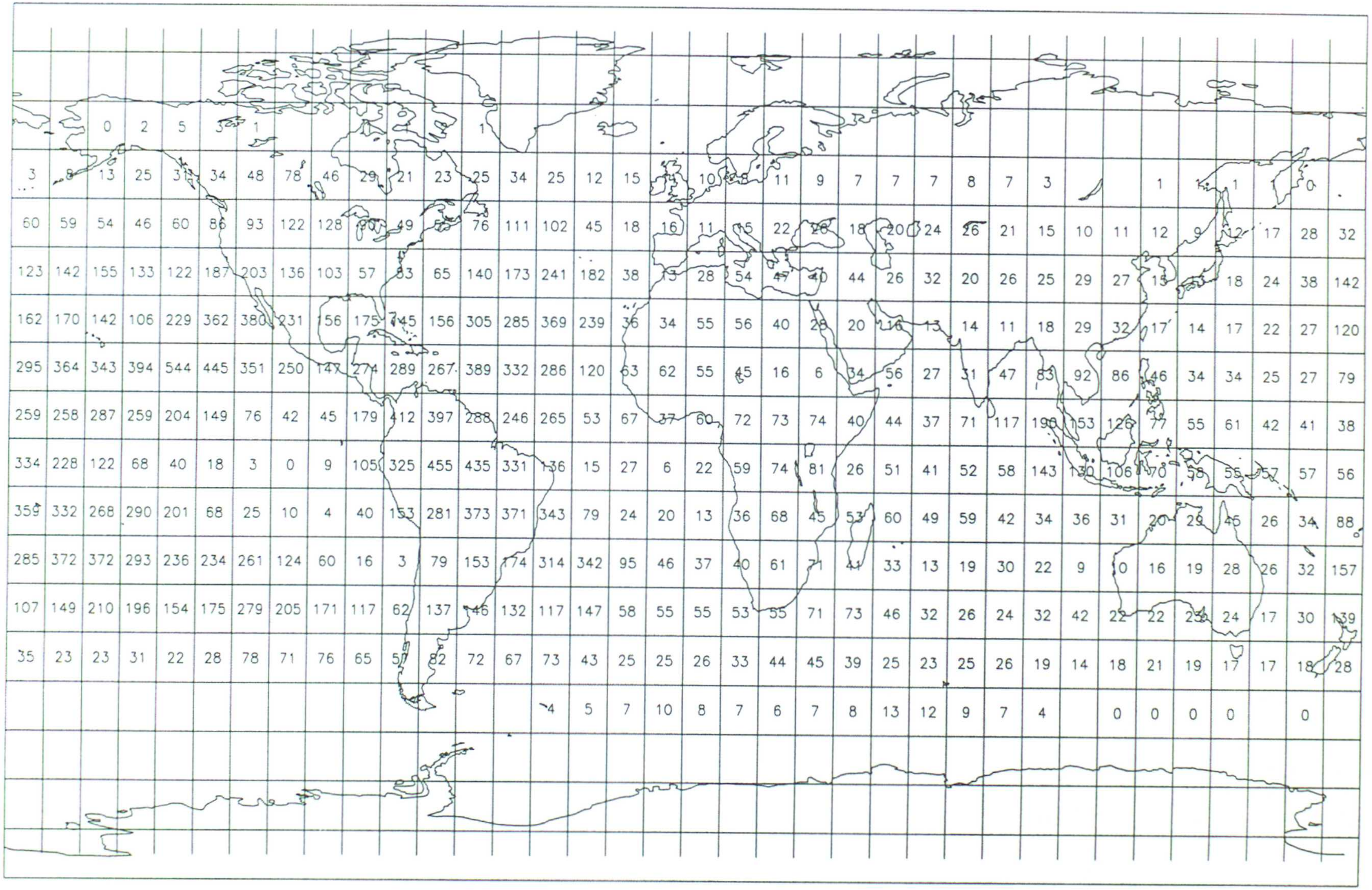
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
NOVEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.0 -.9 -.8 -2.2 .4 -1.0
-1.5 -.7 -.4 -.3 -1.3 -1.5 -1.0 -.6 -.6 -.7 -.8 -.8 -.8 -.9 -1.3 -2.0 -.5 -3.0 -1.5 -1.0 .0 .5 -.2 -1.7 -1.1 -1.0 .2 -1.8 -3.2 -3.0 -.6
-.8 -1.0 -.7 -.9 -1.7 -1.6 -.8 -1.5 -1.5 -.7 -.8 -.4 -1.3 -.8 -.7 .4 -.5 -2.1 -1.6 -2.2 -.6 -.8 -1.2 -.2 .5 .5 .4 1.4 1.2 2.2 1.2 -2.0 -1.2 .7 1.4 .3
1.1 -.5 -1.3 -1.3 -1.0 -.4 .0 -.8 -1.3 -.5 .5 -1.2 -.4 .2 .8 .5 .0 -.7 .3 .4 -.3 2.5 .3 .9 .0 1.7 2.2 2.2 1.8 .9 3.2 .8 1.2 .1 3.9 1.2
.6 .9 .7 -.3 .0 .4 .6 .7 .5 .8 .4 .2 .5 .7 .0 .8 .4 1.4 1.7 3.1 -.7 4.8 1.5 .4 -1.2 3.0 3.2 1.3 3.5 5.2 1.7
3.3 1.3 1.5 1.7 .9 .6 .4 1.1 .9 .1 1.1 .8 .6 1.1 .2 .3 -.9 .8 1.5 1.2 2.4 1.6 1.7 .8 .5 .5 2.8 2.3 3.2
1.9 1.0 1.2 .6 .8 .5 .0 .8 .9 1.0 .3 1.9 2.4 .6 1.0 .6 1.4 .8 .2 1.0 .4 .6 .4 .5 .6 3.1 2.0 1.6 2.0 2.5 1.0 .4 .3 2.9 4.9
2.9 1.4 1.5 .9 .4 1.4 1.2 1.2 2.4 2.5 1.3 2.0 1.6 1.9 2.4 .7 1.6 1.0 .7 -.4 1.2 .7 .9 -.1 1.6 1.3 .6 3.8 -1.3 .9 2.8 3.7
2.6 .4 .5 .7 1.0 .8 .7 .6 -.1 2.2 1.9 .9 1.2 .9 .2 .2 1.6 1.4 1.1 .7 -.2 3.0 .0 1.1 1.4 .0 1.8 3.6 3.5 2.1 1.5 4.9 5.3 6.4 2.6
1.8 .5 1.0 .9 -.1 .1 -.2 .0 -.1 .6 .6 -.7 -.6 -.3 .0 .4 1.5 2.4 2.8 2.5 1.8 1.6 .3 .2 -.9 -.8 2.4 6.7 .6 .5 2.0 5.6 7.6 3.2 .6
-.1 -.4 .1 -.3 -.7 -1.0 -.8 -.9 -.5 -.4 .0 -.7 .0 -.3 .1 .1 .7 1.8 1.0 .3 -.4 .2 .7 .3 1.5 .1 .7 1.3 2.1 2.8 2.2 2.8 2.4 1.0 -.5 .2
.5 .4 .6 .0 -.7 -1.4 -1.2 -.7 -.2 -.3 -.1 .0 .2 .3 -.2 -1.0 -.5 -.3 -.5 -.8 -2.0 -1.6 -.4 -.9 -1.3 -1.6 -.4 -.5 .5 2.0 1.4 1.8 2.9 2.4 1.9 -.3
2.6 -.7 -1.4 -.4 -.5 -.8 -.7 -1.2 -.9 -.4 -.4 -.3 -.5 -.8

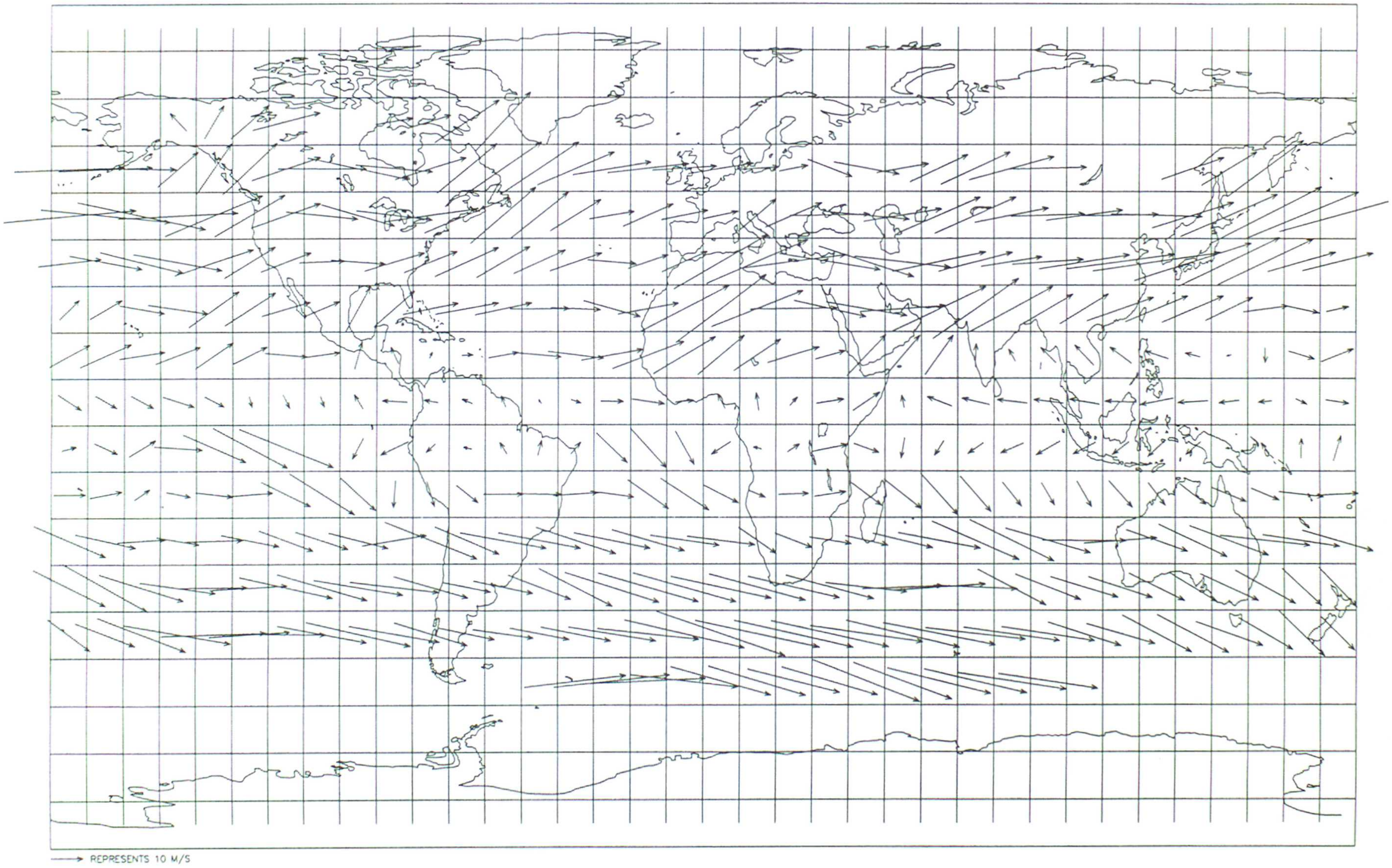
SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
NOVEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 4 4 6 6
5 4 4 4 4 4 4 4 4 4 4 4 5 4 5 7 7 5 5 5 4 6 6 5 5 7 13 10 10
5 5 4 4 4 4 4 4 5 5 4 4 5 5 5 4 5 5 5 6 5 5 5 4 5 4 5 5 6 8 8 11 10 11 12 6
7 5 5 4 5 4 5 4 5 4 5 5 4 4 5 5 4 6 8 6 6 6 7 6 6 6 5 7 8 6 9 10 11 12 12 7
5 4 5 5 4 4 4 4 5 5 5 6 5 4 4 4 4 5 7 8 5 8 7 8 8 10 8 6 9 12 6
8 4 5 5 4 4 4 4 5 5 4 5 5 5 4 4 4 4 4 6 6 7 6 10 9 5 8 9 8
6 5 5 4 4 5 4 4 5 4 5 5 5 3 4 3 7 4 3 4 4 4 4 4 2 6 7 6 6 5 5 6 6 6 9
7 6 7 7 5 4 4 5 6 6 5 5 5 5 6 4 4 4 3 3 4 5 5 5 7 6 5 8 5 5 6 8
6 4 4 4 4 6 4 5 4 7 5 5 4 4 4 4 5 6 4 4 5 5 4 4 6 5 6 9 8 7 6 8 9 9 8
6 4 5 4 4 4 4 4 4 4 5 6 4 5 4 5 4 6 7 5 5 5 4 5 12 6 7 10 8 7 10 11 13 9 6
6 4 4 4 4 4 4 4 4 4 4 5 5 5 4 4 5 6 7 7 7 6 5 5 5 5 5 5 6 6 6 7 8 8 5 5
4 4 4 4 5 5 4 4 4 4 4 4 4 4 5 5 6 6 6 5 7 7 7 6 7 6 5 5 5 7 6 7 7 7 8 5
10 6 6 5 5 5 5 6 5 5 5 5 4 6

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
NOVEMBER 1999

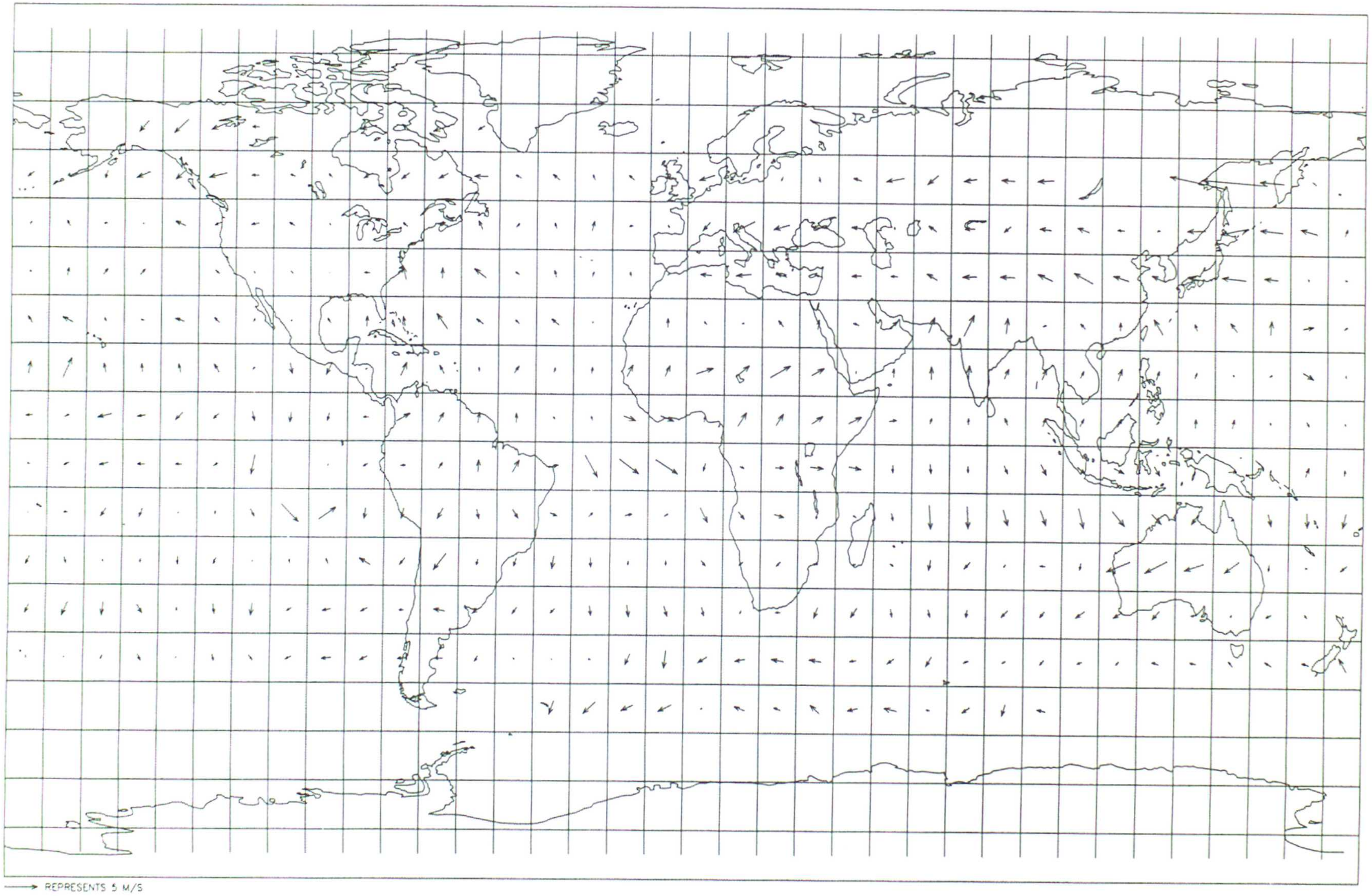

0 2 5 3 1 1
3 8 13 25 31 34 48 78 46 29 21 23 25 34 25 12 15 10 11 9 7 7 7 8 7 3 1 1 1 0
60 59 54 46 60 86 93 122 128 90 49 76 111 102 45 18 16 11 15 22 26 18 20 24 26 21 15 10 11 12 9 12 17 28 32
123 142 155 133 122 187 203 136 103 57 83 65 140 173 241 182 38 13 28 54 47 40 44 26 32 20 26 25 29 27 15 18 24 38 142
162 170 142 106 229 362 380 231 156 175 145 156 305 285 369 239 36 34 55 56 40 28 20 16 13 14 11 18 29 32 17 14 17 22 27 120
295 364 343 394 544 445 351 250 147 274 289 267 389 332 286 120 63 62 55 45 16 6 34 56 27 31 47 83 92 86 46 34 34 25 27 79
259 258 287 259 204 149 76 42 45 179 412 397 288 246 265 53 67 37 60 72 73 74 40 44 37 71 117 190 153 126 77 55 61 42 41 38
334 228 122 68 40 18 3 0 9 105 325 455 435 331 136 15 27 6 22 59 74 81 26 51 41 52 58 143 130 106 70 58 55 57 57 56
359 332 268 290 201 68 25 10 4 40 153 281 373 371 343 79 24 20 13 36 68 45 53 60 49 59 42 34 36 31 20 29 45 26 34 88
285 372 372 293 236 234 261 124 60 16 3 79 153 174 314 342 95 46 37 40 61 71 41 33 13 19 30 22 9 0 16 19 28 26 32 157
107 149 210 196 154 175 279 205 171 117 62 137 146 132 117 147 58 55 55 53 55 71 73 46 32 26 24 32 42 22 22 23 24 17 30 139
35 23 23 31 22 28 78 71 76 65 57 82 72 67 73 43 25 25 26 33 44 45 39 25 23 25 26 19 14 18 21 19 17 17 18 28
4 5 7 10 8 7 6 7 8 13 12 9 7 4 0 0 0 0 0

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA FIGURE 21
NOVEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

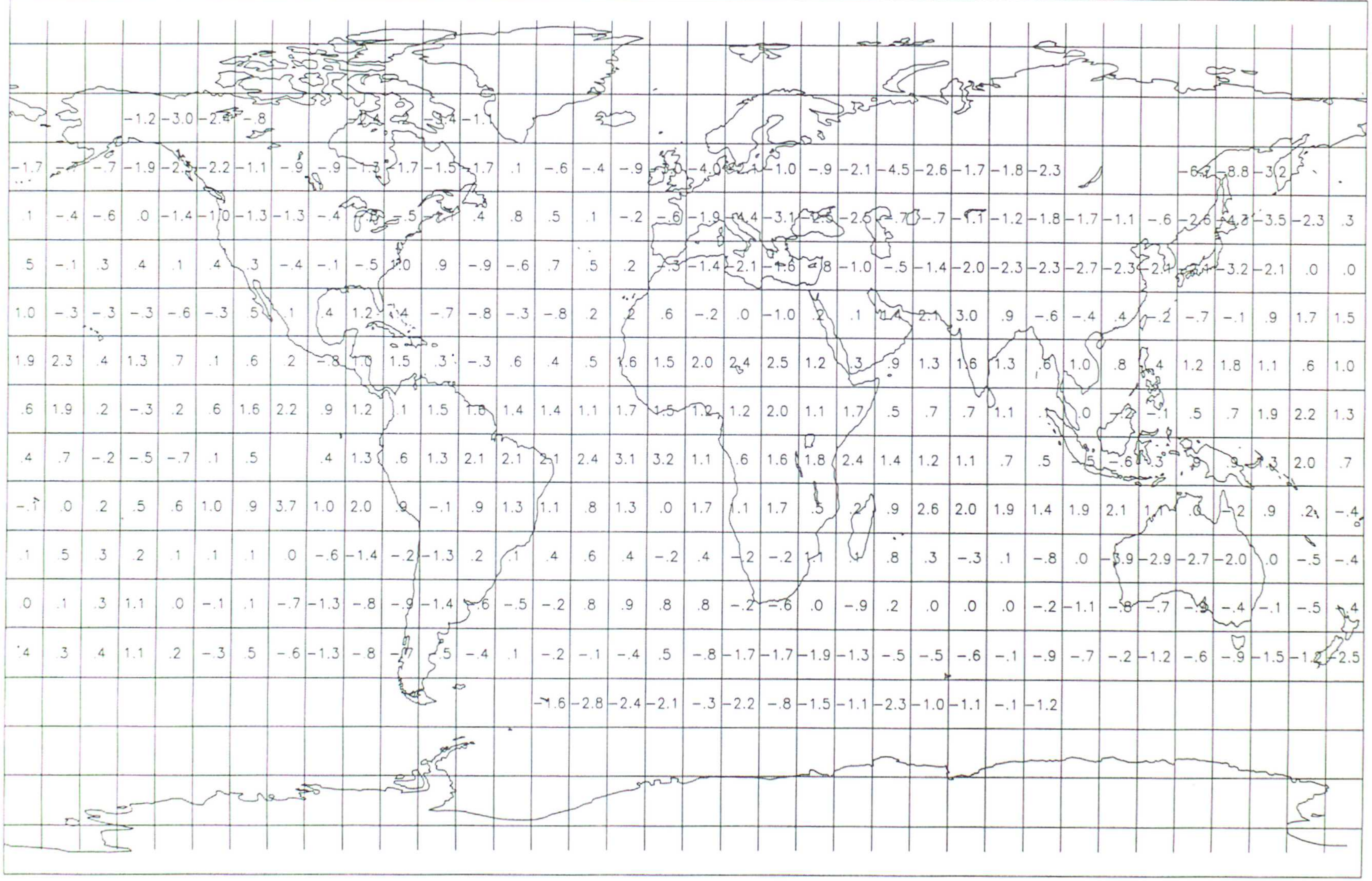

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA
NOVEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

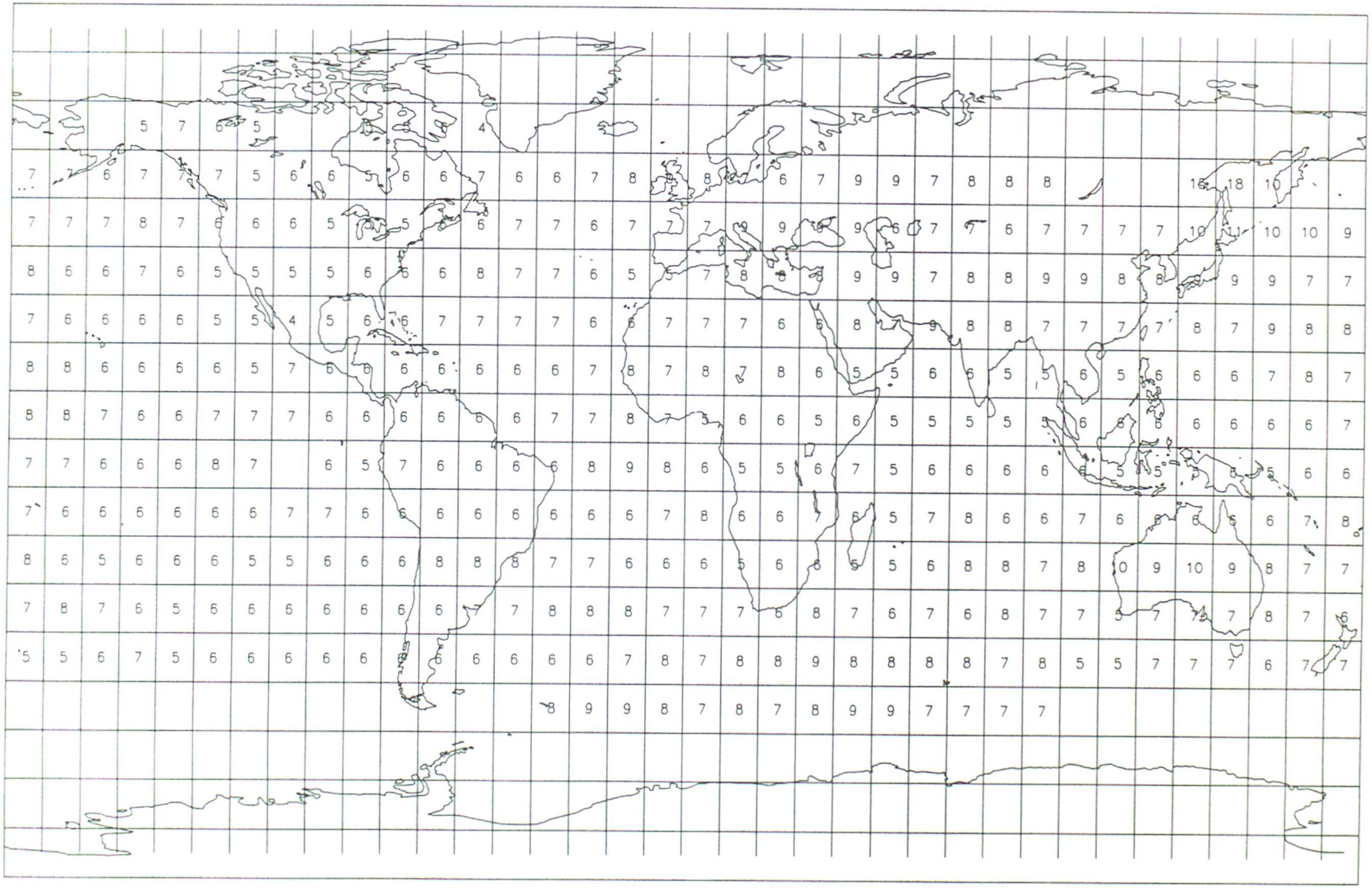
FIGURE 22



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
NOVEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.2 -3.0 -2.4 -.8 -1.4 -.2 -3.4 -1.1
-1.7 -.7 -.7 -1.9 -2.3 -2.2 -1.1 -.9 -.9 -1.3 -1.7 -1.5 -1.7 .1 -.6 -.4 -.9 -3.0 -4.0 -2.1 -1.0 -.9 -2.1 -4.5 -2.6 -1.7 -1.8 -2.3 -6.2 -8.8 -3.2
.1 -.4 -.6 .0 -1.4 -1.0 -1.3 -1.3 -.4 -.8 -.5 -1.1 .4 .8 .5 .1 -.2 -.6 -1.9 -4.4 -3.1 -2.5 -2.6 -.7 -.7 -1.1 -1.2 -1.8 -1.7 -1.1 -.6 -2.6 -4.3 -3.5 -2.3 .3
.5 -.1 .3 .4 .1 .4 .3 -.4 -.1 -.5 1.0 .9 -.9 -.6 .7 .5 .2 -.3 -1.4 -2.1 -1.6 -.8 -1.0 -.5 -1.4 -2.0 -2.3 -2.3 -2.7 -2.3 -2.1 -3.1 -3.2 -2.1 .0 .0
1.0 -.3 -.3 -.3 -.6 -.3 .5 .1 .4 1.2 .4 -.7 -.8 -.3 -.8 .2 .2 .6 -.2 .0 -1.0 .2 .1 1.4 2.1 3.0 .9 -.6 -.4 .4 -.2 -.7 -.1 .9 1.7 1.5
1.9 2.3 .4 1.3 .7 .1 .6 .2 -.8 1.0 1.5 .3 -.3 .6 .4 .5 1.6 1.5 2.0 2.4 2.5 1.2 .3 .9 1.3 1.6 1.3 .6 1.0 .8 .4 1.2 1.8 1.1 .6 1.0
.6 1.9 .2 -.3 .2 .6 1.6 2.2 .9 1.2 .1 1.5 1.8 1.4 1.4 1.1 1.7 1.5 1.2 1.2 2.0 1.1 1.7 .5 .7 .7 1.1 .1 .0 -.2 -.1 .5 .7 1.9 2.2 1.3
.4 .7 -.2 -.5 -.7 .1 .5 .4 1.3 .6 1.3 2.1 2.1 2.1 2.4 3.1 3.2 1.1 .6 1.6 1.8 2.4 1.4 1.2 1.1 .7 .5 -.5 -.6 .3 .9 .9 1.3 2.0 .7
-.1 .0 .2 .5 .6 1.0 .9 3.7 1.0 2.0 .9 -.1 .9 1.3 1.1 .8 1.3 .0 1.7 1.1 1.7 .5 .2 .9 2.6 2.0 1.9 1.4 1.9 2.1 1.1 .0 -.2 .9 .2 -.4
.1 .5 .3 .2 .1 .1 .1 .0 -.6 -1.4 -.2 -1.3 .2 .1 .4 .6 .4 -.2 .4 -.2 -.2 1.1 .1 .8 .3 -.3 .1 -.8 .0 -3.9 -2.9 -2.7 -2.0 .0 -.5 -.4
.0 .1 .3 1.1 .0 -.1 .1 -.7 -1.3 -.8 -.9 -1.4 -.6 -.5 -.2 .8 .9 .8 .8 -.2 -.6 .0 -.9 .2 .0 .0 .0 -.2 -1.1 -.8 -.7 -.9 -.4 -.1 -.5 .4
.4 .3 .4 1.1 .2 -.3 .5 -.6 -1.3 -.8 -.7 .5 -.4 .1 -.2 -.1 -.4 .5 -.8 -1.7 -1.7 -1.9 -1.3 -.5 -.5 -.6 -.1 -.9 -.7 -.2 -1.2 -.6 -.9 -1.5 -1.2 -2.5
-1.6 -2.8 -2.4 -2.1 -.3 -2.2 -.8 -1.5 -1.1 -2.3 -1.0 -1.1 -.1 -1.2

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
NOVEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

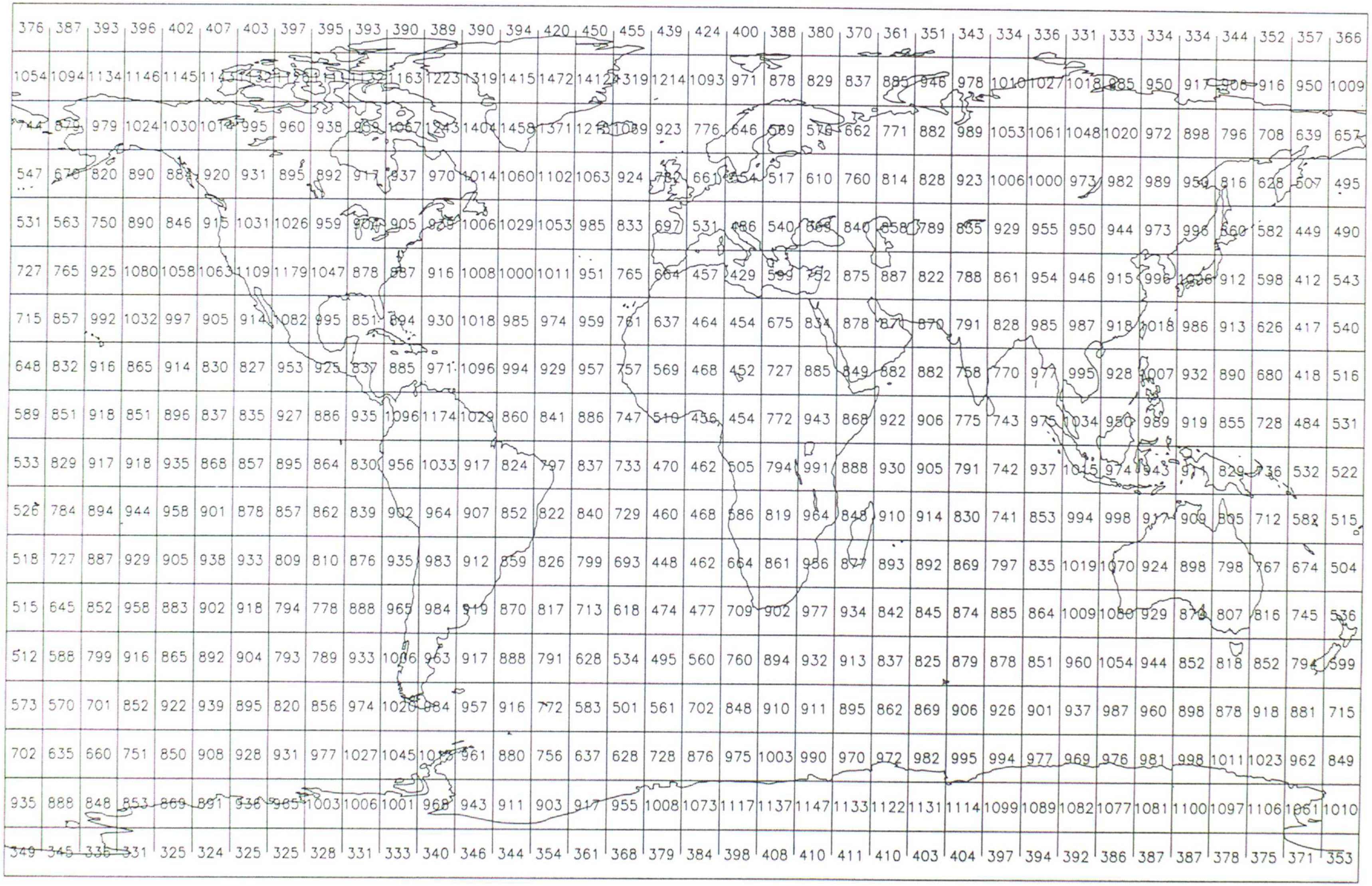
MONTH: NOVEMBER 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-15.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100)
	:Mean and standard deviation observation-minus-background brightness temperature differences

ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS
NOVEMBER 1999
NOAA–15, USING ALL OBSERVATIONS

FIGURE 25



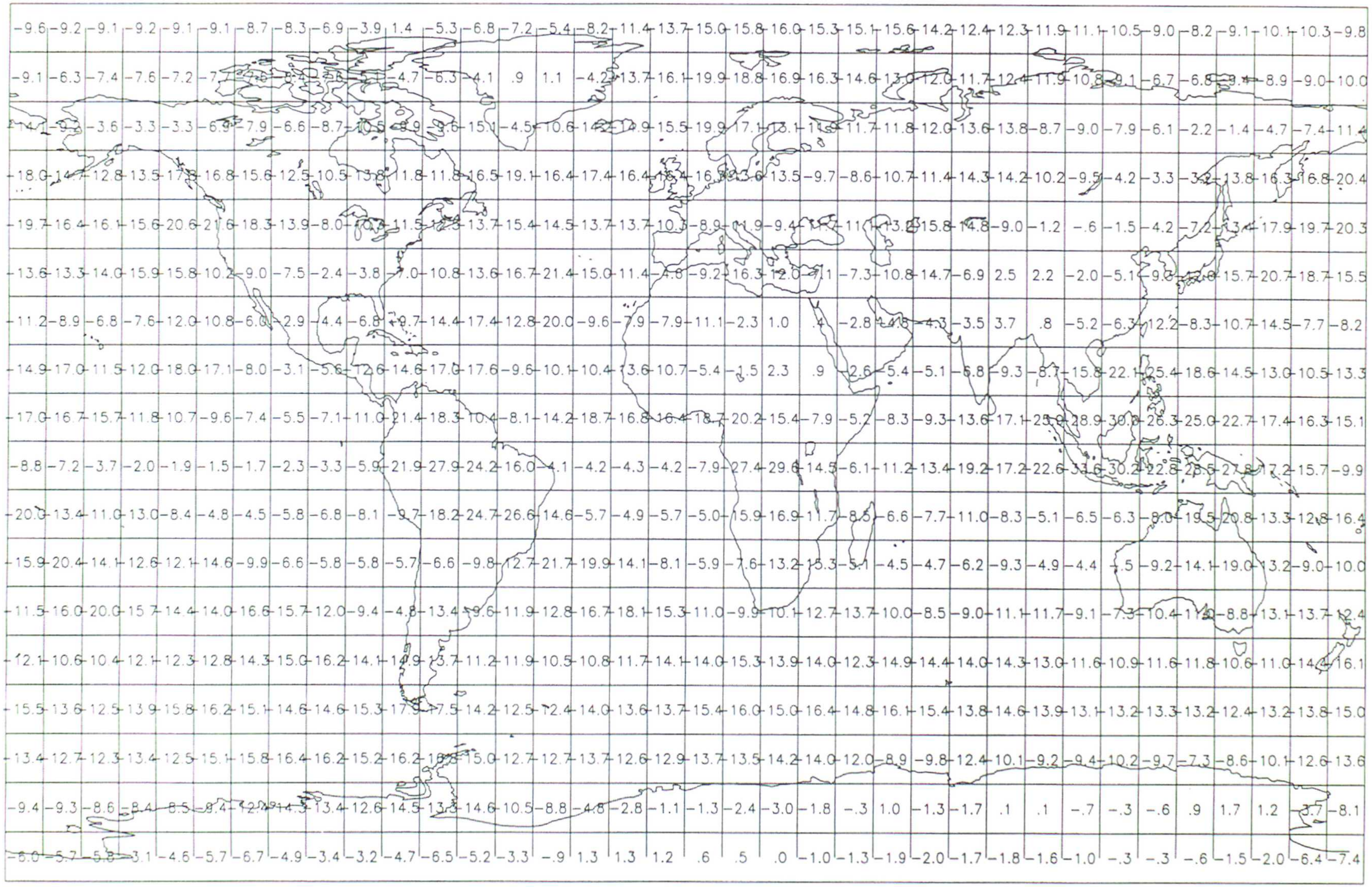
376	387	393	396	402	407	403	397	395	393	390	389	390	394	420	450	455	439	424	400	388	380	370	361	351	343	334	336	331	333	334	334	344	352	357	366
1054	1094	1134	1146	1145	1143	1132	1126	[illegible]	1132	1163	1223	1319	1415	1472	1412	1319	1214	1093	971	878	829	837	885	946	978	1010	1027	1018	985	950	917	906	916	950	1009
744	879	979	1024	1030	1014	995	960	938	969	1067	1243	1404	1458	1371	1213	1089	923	776	646	589	576	662	771	882	989	1053	1061	1048	1020	972	898	796	708	639	657
547	670	820	890	884	920	931	895	892	917	937	970	1014	1060	1102	1063	924	782	661	554	517	610	760	814	828	923	1006	1000	973	982	989	959	816	628	507	495
531	563	750	890	846	915	1031	1026	959	904	905	939	1006	1029	1053	985	833	697	531	486	540	569	840	858	789	835	929	955	950	944	973	996	560	582	449	490
727	765	925	1080	1058	1063	1109	1179	1047	878	887	916	1008	1000	1011	951	765	664	457	429	599	752	875	887	822	788	861	954	946	915	996	1036	912	598	412	543
715	857	992	1032	997	905	914	1082	995	851	894	930	1018	985	974	959	761	637	464	454	675	834	878	871	870	791	828	985	987	918	1018	986	913	626	417	540
648	832	916	865	914	830	827	953	925	837	885	971	1096	994	929	957	757	569	468	452	727	885	849	882	882	758	770	977	995	928	1007	932	890	680	418	516
589	851	918	851	896	837	835	927	886	935	1096	1174	1029	860	841	886	747	510	456	454	772	943	868	922	906	775	743	975	1034	950	989	919	855	728	484	531
533	829	917	918	935	868	857	895	864	830	956	1033	917	824	797	837	733	470	462	505	794	991	888	930	905	791	742	937	1015	974	943	911	829	736	532	522
526	784	894	944	958	901	878	857	862	839	902	964	907	852	822	840	729	460	468	586	819	964	848	910	914	830	741	853	994	998	917	909	805	712	582	515
518	727	887	929	905	938	933	809	810	876	935	983	912	859	826	799	693	448	462	664	861	956	877	893	892	869	797	835	1019	1070	924	898	798	767	674	504
515	645	852	958	883	902	918	794	778	888	965	984	919	870	817	713	618	474	477	709	902	977	934	842	845	874	885	864	1009	1080	929	878	807	816	745	536
512	588	799	916	865	892	904	793	789	933	1006	963	917	888	791	628	534	495	560	760	894	932	913	837	825	879	878	851	960	1054	944	852	818	852	794	599
573	570	701	852	922	939	895	820	856	974	1020	984	957	916	772	583	501	561	702	848	910	911	895	862	869	906	926	901	937	987	960	898	878	918	881	715
702	635	660	751	850	908	928	931	977	1027	1045	1015	961	880	756	637	628	728	876	975	1003	990	970	972	982	995	994	977	969	976	981	998	1011	1023	962	849
935	888	848	853	869	891	936	965	1003	1006	1001	968	943	911	903	917	955	1008	1073	1117	1137	1147	1133	1122	1131	1114	1099	1089	1082	1077	1081	1100	1097	1106	1061	1010
349	345	335	331	325	324	325	325	328	331	333	340	346	344	354	361	368	379	384	398	408	410	411	410	403	404	397	394	392	386	387	387	378	375	371	353

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

FIGURE 26

NOVEMBER 1999 : HIRS8 channel (Surface)

NOAA-15, USING ALL OBSERVATIONS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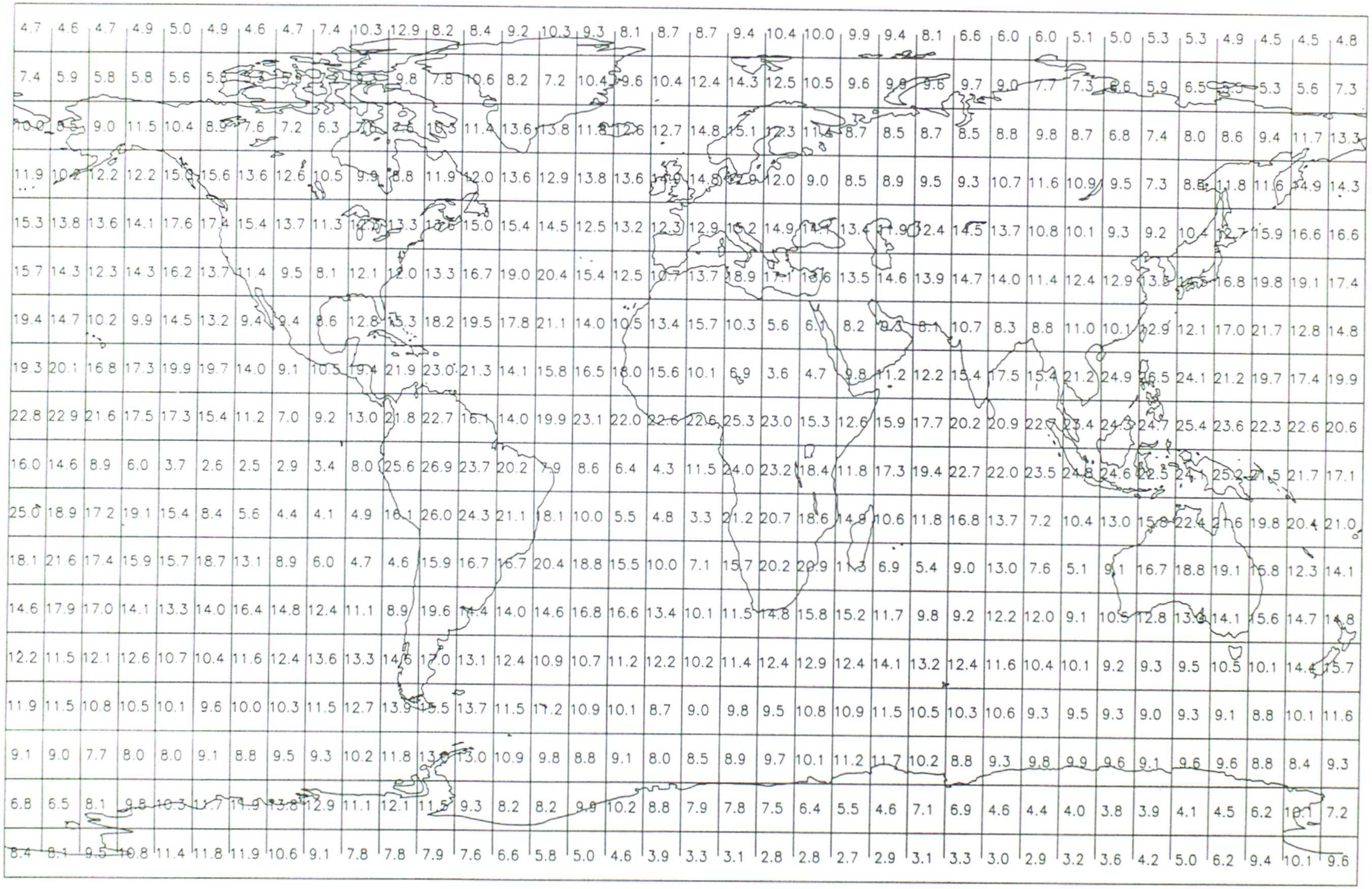
-9.1 -6.3 -7.4 -7.6 -7.2 -7.7 -7.6 -6.4 -7.6 -5.1 -4.7 -6.3 -4.1 .9 1.1 -4.2 -13.7 -16.1 -19.9 -18.8 -16.9 -16.3 -14.6 -13.0 -12.0 -11.7 -12.4 -11.9 -10.8 -9.1 -6.7 -6.8 -9.4 -8.9 -9.0 -10.0
-14.1 -9.2 -3.6 -3.3 -3.3 -6.9 -7.9 -6.6 -8.7 -10.5 -8.9 -9.6 -15.1 -4.5 -10.6 -14.2 -14.9 -15.5 -19.9 -17.1 -13.1 [illegible] -11.7 -11.8 -12.0 -13.6 -13.8 -8.7 -9.0 -7.9 -6.1 -2.2 -1.4 -4.7 -7.4 -11.4
-18.0 -14.7 -12.8 -13.5 -17.8 -16.8 -15.6 -12.5 -10.5 -13.8 -11.8 -11.8 -16.5 -19.1 -16.4 -17.4 -16.4 -18.4 [illegible] -13.6 -13.5 -9.7 -8.6 -10.7 -11.4 -14.3 -14.2 -10.2 -9.5 -4.2 -3.3 -3.2 -13.8 -16.3 -16.8 -20.4
-19.7 -16.4 -16.1 -15.6 -20.6 -21.6 -18.3 -13.9 -8.0 -10.7 -11.5 -12.3 -13.7 -15.4 -14.5 -13.7 -13.7 -10.3 -8.9 -11.9 -9.4 -11.7 -11.1 -13.2 -15.8 -14.8 -9.0 -1.2 -.6 -1.5 -4.2 -7.2 -13.4 -17.9 -19.7 -20.3
-13.6 -13.3 -14.0 -15.9 -15.8 -10.2 -9.0 -7.5 -2.4 -3.8 -7.0 -10.8 -13.6 -16.7 -21.4 -15.0 -11.4 -4.8 -9.2 -16.3 -12.0 -7.1 -7.3 -10.8 -14.7 -6.9 2.5 2.2 -2.0 -5.1 -9.0 -12.0 -15.7 -20.7 -18.7 -15.5
-11.2 -8.9 -6.8 -7.6 -12.0 -10.8 -6.0 -2.9 -4.4 -6.8 -9.7 -14.4 -17.4 -12.8 -20.0 -9.6 -7.9 -7.9 -11.1 -2.3 1.0 .4 -2.8 -4.8 -4.3 -3.5 3.7 .8 -5.2 -6.3 -12.2 -8.3 -10.7 -14.5 -7.7 -8.2
-14.9 -17.0 -11.5 -12.0 -18.0 -17.1 -8.0 -3.1 -5.6 -12.6 -14.6 -17.0 -17.6 -9.6 -10.1 -10.4 -13.6 -10.7 -5.4 -1.5 2.3 .9 -2.6 -5.4 -5.1 -6.8 -9.3 -8.7 -15.8 -22.1 -25.4 -18.6 -14.5 -13.0 -10.5 -13.3
-17.0 -16.7 -15.7 -11.8 -10.7 -9.6 -7.4 -5.5 -7.1 -11.0 -21.4 -18.3 -10.4 -8.1 -14.2 -18.7 -16.8 -16.4 -18.7 -20.2 -15.4 -7.9 -5.2 -8.3 -9.3 -13.6 -17.1 -25.9 -28.9 -30.0 -26.3 -25.0 -22.7 -17.4 -16.3 -15.1
-8.8 -7.2 -3.7 -2.0 -1.9 -1.5 -1.7 -2.3 -3.3 -5.9 -21.9 -27.9 -24.2 -16.0 -4.1 -4.2 -4.3 -4.2 -7.9 -27.4 -29.6 -14.5 -6.1 -11.2 -13.4 -19.2 -17.2 -22.6 -33.6 -30.2 -22.8 -23.5 -27.8 -17.2 -15.7 -9.9
-20.0 -13.4 -11.0 -13.0 -8.4 -4.8 -4.5 -5.8 -6.8 -8.1 -9.7 -18.2 -24.7 -26.6 -14.6 -5.7 -4.9 -5.7 -5.0 -15.9 -16.9 -11.7 -8.5 -6.6 -7.7 -11.0 -8.3 -5.1 -6.5 -6.3 -8.0 -19.5 -20.8 -13.3 -12.8 -16.4
-15.9 -20.4 -14.1 -12.6 -12.1 -14.6 -9.9 -6.6 -5.8 -5.8 -5.7 -6.6 -9.8 -12.7 -21.7 -19.9 -14.1 -8.1 -5.9 -7.6 -13.2 -15.3 -5.1 -4.5 -4.7 -6.2 -9.3 -4.9 -4.4 -.5 -9.2 -14.1 -19.0 -13.2 -9.0 -10.0
-11.5 -16.0 -20.0 -15.7 -14.4 -14.0 -16.6 -15.7 -12.0 -9.4 -4.8 -13.4 -9.6 -11.9 -12.8 -16.7 -18.1 -15.3 -11.0 -9.9 -10.1 -12.7 -13.7 -10.0 -8.5 -9.0 -11.1 -11.7 -9.1 -7.3 -10.4 -11.0 -8.8 -13.1 -13.7 -12.4
-12.1 -10.6 -10.4 -12.1 -12.3 -12.8 -14.3 -15.0 -16.2 -14.1 -14.9 -13.7 -11.2 -11.9 -10.5 -10.8 -11.7 -14.1 -14.0 -15.3 -13.9 -14.0 -12.3 -14.9 -14.4 -14.0 -14.3 -13.0 -11.6 -10.9 -11.6 -11.8 -10.6 -11.0 -14.4 -16.1
-15.5 -13.6 -12.5 -13.9 -15.8 -16.2 -15.1 -14.6 -14.6 -15.3 -17.9 -17.5 -14.2 -12.5 -12.4 -14.0 -13.6 -13.7 -15.4 -16.0 -15.0 -16.4 -14.8 -16.1 -15.4 -13.8 -14.6 -13.9 -13.1 -13.2 -13.3 -13.2 -12.4 -13.2 -13.8 -15.0
-13.4 -12.7 -12.3 -13.4 -12.5 -15.1 -15.8 -16.4 -16.2 -15.2 -16.2 [illegible] -15.0 -12.7 -12.7 -13.7 -12.6 -12.9 -13.7 -13.5 -14.2 -14.0 -12.0 -8.9 -9.8 -12.4 -10.1 -9.2 -9.4 -10.2 -9.7 -7.3 -8.6 -10.1 -12.6 -13.6
-9.4 -9.3 -8.6 -8.4 -8.5 -9.4 [illegible] -14.3 -13.4 -12.6 -14.5 -13.3 -14.6 -10.5 -8.8 -4.8 -2.8 -1.1 -1.3 -2.4 -3.0 -1.8 -.3 1.0 -1.3 -1.7 .1 .1 -.7 -.3 -.6 .9 1.7 1.2 -3.7 -8.1
-6.0 -5.7 -5.8 -3.1 -4.6 -5.7 -6.7 -4.9 -3.4 -3.2 -4.7 -6.5 -5.2 -3.3 -.9 1.3 1.3 1.2 .6 .5 .0 -1.0 -1.3 -1.9 -2.0 -1.7 -1.8 -1.6 -1.0 -.3 -.3 -.6 -1.5 -2.0 -6.4 -7.4

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : HIRS8 channel (Surface)
NOAA-15, USING ALL OBSERVATIONS

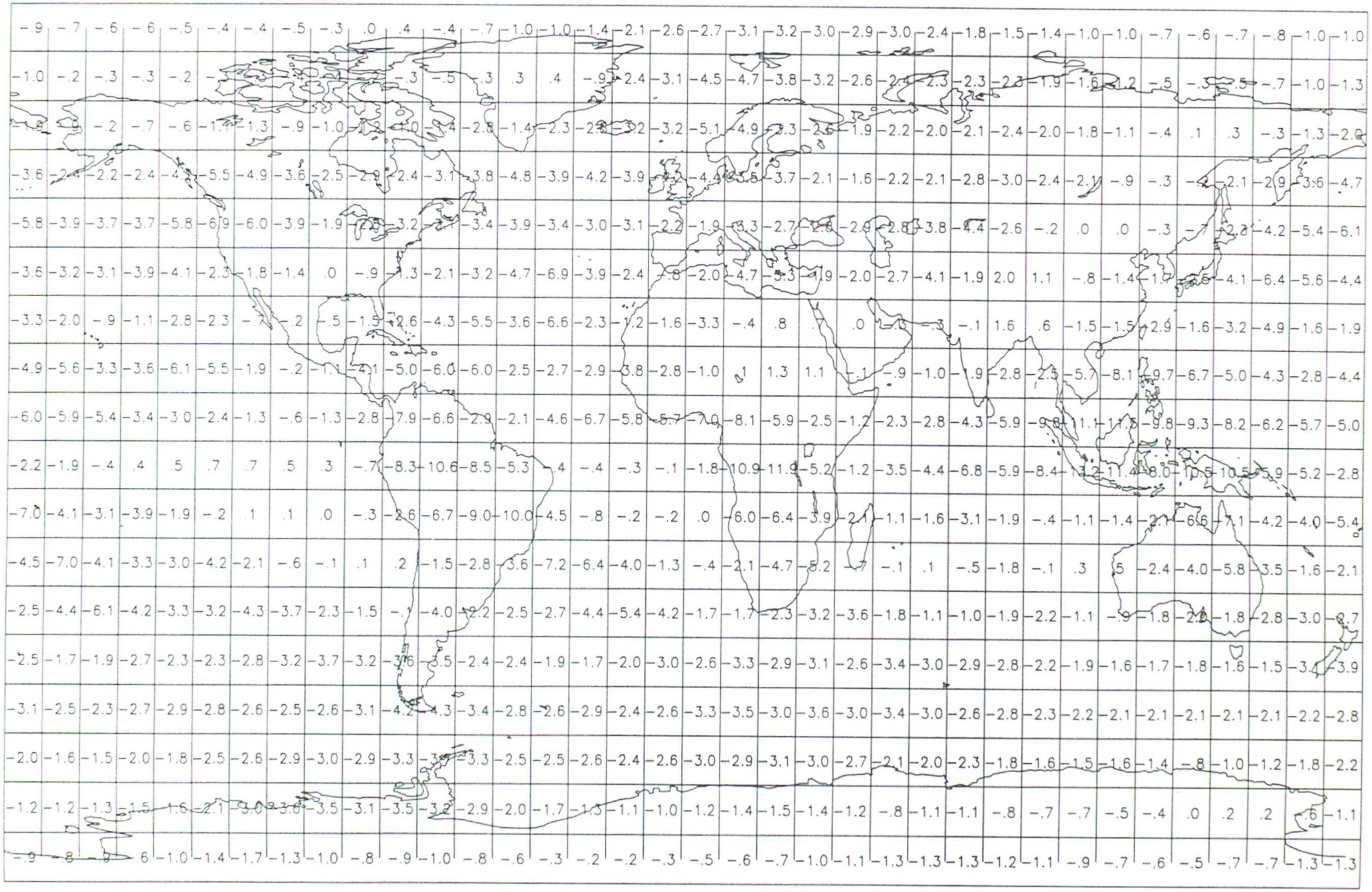
FIGURE 27



4.7	4.6	4.7	4.9	5.0	4.9	4.6	4.7	7.4	10.3	12.9	8.2	8.4	9.2	10.3	9.3	8.1	8.7	8.7	9.4	10.4	10.0	9.9	9.4	8.1	6.6	6.0	6.0	5.1	5.0	5.3	5.3	4.9	4.5	4.5	4.8
7.4	5.9	5.8	5.8	5.6	5.8	[illegible]	5.6	[illegible]	9.3	9.8	7.8	10.6	8.2	7.2	10.4	9.6	10.4	12.4	14.3	12.5	10.5	9.6	9.9	9.6	9.7	9.0	7.7	7.3	6.6	5.9	6.5	5.5	5.3	5.6	7.3
10.0	8.5	9.0	11.5	10.4	8.9	7.6	7.2	6.3	7.6	7.6	10.3	11.4	13.6	13.8	11.8	12.6	12.7	14.8	15.1	12.3	11.4	8.7	8.5	8.7	8.5	8.8	9.8	8.7	6.8	7.4	8.0	8.6	9.4	11.7	13.3
11.9	10.2	12.2	12.2	15.0	15.6	13.6	12.6	10.5	9.9	8.8	11.9	12.0	13.6	12.9	13.8	13.6	14.9	14.8	12.9	12.0	9.0	8.5	8.9	9.5	9.3	10.7	11.6	10.9	9.5	7.3	8.8	11.8	11.6	14.9	14.3
15.3	13.8	13.6	14.1	17.6	17.4	15.4	13.7	11.3	[illegible]	13.3	13.6	15.0	15.4	14.5	12.5	13.2	12.3	12.9	15.2	14.9	14.1	13.4	11.9	12.4	14.5	13.7	10.8	10.1	9.3	9.2	10.4	12.7	15.9	16.6	16.6
15.7	14.3	12.3	14.3	16.2	13.7	11.4	9.5	8.1	12.1	12.0	13.3	16.7	19.0	20.4	15.4	12.5	10.7	13.7	18.9	17.1	13.6	13.5	14.6	13.9	14.7	14.0	11.4	12.4	12.9	13.6	15.5	16.8	19.8	19.1	17.4
19.4	14.7	10.2	9.9	14.5	13.2	9.4	9.4	8.6	12.8	15.3	18.2	19.5	17.8	21.1	14.0	10.5	13.4	15.7	10.3	5.6	6.1	8.2	9.3	8.1	10.7	8.3	8.8	11.0	10.1	12.9	12.1	17.0	21.7	12.8	14.8
19.3	20.1	16.8	17.3	19.9	19.7	14.0	9.1	10.5	19.4	21.9	23.0	21.3	14.1	15.8	16.5	18.0	15.6	10.1	6.9	3.6	4.7	9.8	11.2	12.2	15.4	17.5	15.4	21.2	24.9	26.5	24.1	21.2	19.7	17.4	19.9
22.8	22.9	21.6	17.5	17.3	15.4	11.2	7.0	9.2	13.0	21.8	22.7	16.1	14.0	19.9	23.1	22.0	22.6	22.6	25.3	23.0	15.3	12.6	15.9	17.7	20.2	20.9	22.7	23.4	24.3	24.7	25.4	23.6	22.3	22.6	20.6
16.0	14.6	8.9	6.0	3.7	2.6	2.5	2.9	3.4	8.0	25.6	26.9	23.7	20.2	7.9	8.6	6.4	4.3	11.5	24.0	23.2	18.4	11.8	17.3	19.4	22.7	22.0	23.5	24.8	24.6	22.5	24.1	25.2	21.5	21.7	17.1
25.0	18.9	17.2	19.1	15.4	8.4	5.6	4.4	4.1	4.9	16.1	26.0	24.3	21.1	18.1	10.0	5.5	4.8	3.3	21.2	20.7	18.6	14.9	10.6	11.8	16.8	13.7	7.2	10.4	13.0	15.8	22.4	21.6	19.8	20.4	21.0
18.1	21.6	17.4	15.9	15.7	18.7	13.1	8.9	6.0	4.7	4.6	15.9	16.7	16.7	20.4	18.8	15.5	10.0	7.1	15.7	20.2	20.9	11.3	6.9	5.4	9.0	13.0	7.6	5.1	9.1	16.7	18.8	19.1	15.8	12.3	14.1
14.6	17.9	17.0	14.1	13.3	14.0	16.4	14.8	12.4	11.1	8.9	19.6	14.4	14.0	14.6	16.8	16.6	13.4	10.1	11.5	14.8	15.8	15.2	11.7	9.8	9.2	12.2	12.0	9.1	10.5	12.8	13.6	14.1	15.6	14.7	14.8
12.2	11.5	12.1	12.6	10.7	10.4	11.6	12.4	13.6	13.3	14.6	17.0	13.1	12.4	10.9	10.7	11.2	12.2	10.2	11.4	12.4	12.9	12.4	14.1	13.2	12.4	11.6	10.4	10.1	9.2	9.3	9.5	10.5	10.1	14.4	15.7
11.9	11.5	10.8	10.5	10.1	9.6	10.0	10.3	11.5	12.7	13.9	15.5	13.7	11.5	11.2	10.9	10.1	8.7	9.0	9.8	9.5	10.8	10.9	11.5	10.5	10.3	10.6	9.3	9.5	9.3	9.0	9.3	9.1	8.8	10.1	11.6
9.1	9.0	7.7	8.0	8.0	9.1	8.8	9.5	9.3	10.2	11.8	13.0	13.0	10.9	9.8	8.8	9.1	8.0	8.5	8.9	9.7	10.1	11.2	11.7	10.2	8.8	9.3	9.8	9.9	9.6	9.1	9.6	9.6	8.8	8.4	9.3
6.8	6.5	8.1	9.8	10.3	11.7	11.9	13.8	12.9	11.1	12.1	11.5	9.3	8.2	8.2	9.9	10.2	8.8	7.9	7.8	7.5	6.4	5.5	4.6	7.1	6.9	4.6	4.4	4.0	3.8	3.9	4.1	4.5	6.2	10.1	7.2
8.4	8.1	9.5	10.8	11.4	11.8	11.9	10.6	9.1	7.8	7.8	7.9	7.6	6.6	5.8	5.0	4.6	3.9	3.3	3.1	2.8	2.8	2.7	2.9	3.1	3.3	3.0	2.9	3.2	3.6	4.2	5.0	6.2	9.4	10.1	9.6

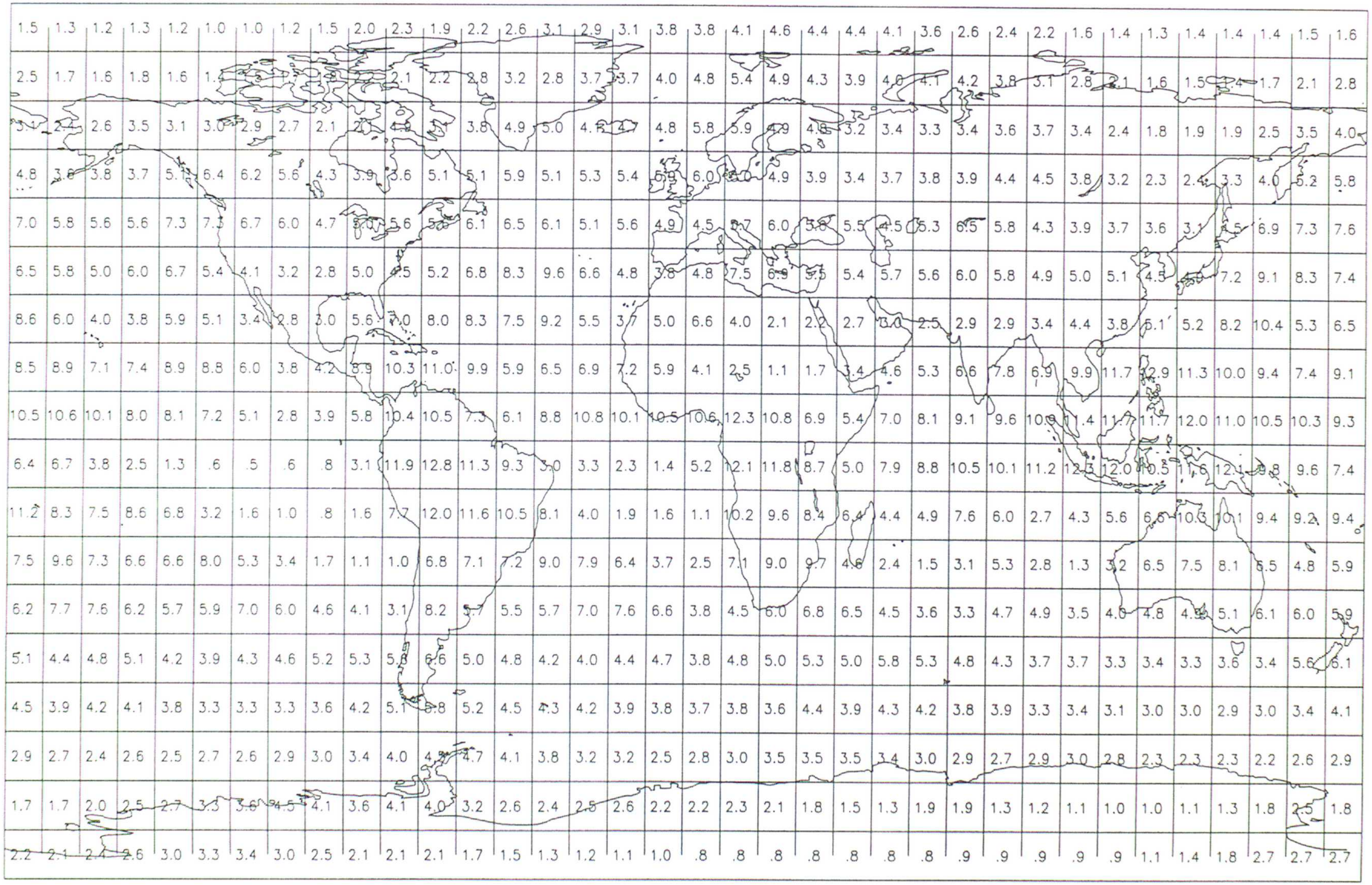
ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
NOVEMBER 1999 : HIRS15 Channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 28


-.9 -.7 -.6 -.6 -.5 -.4 -.4 -.5 -.3 .0 .4 -.4 -.7 -1.0 -1.0 -1.4 -2.1 -2.6 -2.7 -3.1 -3.2 -3.0 -2.9 -3.0 -2.4 -1.8 -1.5 -1.4 -1.0 -1.0 -.7 -.6 -.7 -.8 -1.0 -1.0
-1.0 -.2 -.3 -.3 -.2 -.3 -.5 .3 .3 .4 -.9 -2.4 -3.1 -4.5 -4.7 -3.8 -3.2 -2.6 -2.4 -2.3 -2.3 -2.3 -1.9 -1.6 -1.2 -.5 -.3 -.5 -.7 -1.0 -1.3
-.2 -.7 -.6 -1.1 -1.3 -.9 -1.0 -1.2 -1.0 -1.4 -2.8 -1.4 -2.3 -2.3 -3.2 -3.2 -5.1 -4.9 -3.3 -2.6 -1.9 -2.2 -2.0 -2.1 -2.4 -2.0 -1.8 -1.1 -.4 .1 .3 -.3 -1.3 -2.0
-3.6 -2.4 -2.2 -2.4 -5.5 -4.9 -3.6 -2.5 -2.9 -2.4 -3.1 -3.8 -4.8 -3.9 -4.2 -3.9 -4.4 -3.5 -3.7 -2.1 -1.6 -2.2 -2.1 -2.8 -3.0 -2.4 -2.1 -.9 -.3 -2.1 -2.9 -3.6 -4.7
-5.8 -3.9 -3.7 -3.7 -5.8 -6.9 -6.0 -3.9 -1.9 -2.5 -3.2 -3.4 -3.9 -3.4 -3.0 -3.1 -2.2 -1.9 -3.3 -2.7 -2.6 -2.9 -2.8 -3.8 -4.4 -2.6 -.2 .0 .0 -.3 -.7 -2.3 -4.2 -5.4 -6.1
-3.6 -3.2 -3.1 -3.9 -4.1 -2.3 -1.8 -1.4 .0 -.9 -1.3 -2.1 -3.2 -4.7 -6.9 -3.9 -2.4 -.8 -2.0 -4.7 -5.3 -1.9 -2.0 -2.7 -4.1 -1.9 2.0 1.1 -.8 -1.4 -1.7 -2.6 -4.1 -6.4 -5.6 -4.4
-3.3 -2.0 -.9 -1.1 -2.8 -2.3 -.7 -.2 -.5 -1.5 -2.6 -4.3 -5.5 -3.6 -6.6 -2.3 -1.2 -1.6 -3.3 -.4 .8 .7 .0 -.3 -.3 -.1 1.6 .6 -1.5 -1.5 -2.9 -1.6 -3.2 -4.9 -1.6 -1.9
-4.9 -5.6 -3.3 -3.6 -6.1 -5.5 -1.9 -.2 -1.1 -4.1 -5.0 -6.0 -6.0 -2.5 -2.7 -2.9 -3.8 -2.8 -1.0 .1 1.3 1.1 -.1 -.9 -1.0 -1.9 -2.8 -2.5 -5.7 -8.1 -9.7 -6.7 -5.0 -4.3 -2.8 -4.4
-6.0 -5.9 -5.4 -3.4 -3.0 -2.4 -1.3 -.6 -1.3 -2.8 -7.9 -6.6 -2.9 -2.1 -4.6 -6.7 -5.8 -5.7 -7.0 -8.1 -5.9 -2.5 -1.2 -2.3 -2.8 -4.3 -5.9 -9.8 -11.1 -11.5 -9.8 -9.3 -8.2 -6.2 -5.7 -5.0
-2.2 -1.9 -.4 .4 .5 .7 .7 .5 .3 -.7 -8.3 -10.6 -8.5 -5.3 .4 -.4 -.3 -.1 -1.8 -10.9 -11.9 -5.2 -1.2 -3.5 -4.4 -6.8 -5.9 -8.4 -13.2 -11.4 -8.0 -10.5 -10.5 -5.9 -5.2 -2.8
-7.0 -4.1 -3.1 -3.9 -1.9 -.2 .1 .1 .0 -.3 -2.6 -6.7 -9.0 -10.0 -4.5 -.8 -.2 -.2 .0 -6.0 -6.4 -3.9 -2.1 -1.1 -1.6 -3.1 -1.9 -.4 -1.1 -1.4 -2.1 -6.6 -7.1 -4.2 -4.0 -5.4
-4.5 -7.0 -4.1 -3.3 -3.0 -4.2 -2.1 -.6 -.1 .1 .2 -1.5 -2.8 -3.6 -7.2 -6.4 -4.0 -1.3 -.4 -2.1 -4.7 -5.2 -.7 -.1 .1 -.5 -1.8 -.1 .3 .5 -2.4 -4.0 -5.8 -3.5 -1.6 -2.1
-2.5 -4.4 -6.1 -4.2 -3.3 -3.2 -4.3 -3.7 -2.3 -1.5 -.1 -4.0 -2.2 -2.5 -2.7 -4.4 -5.4 -4.2 -1.7 -1.7 -2.3 -3.2 -3.6 -1.8 -1.1 -1.0 -1.9 -2.2 -1.1 -.9 -1.8 -2.0 -1.8 -2.8 -3.0 -2.7
-2.5 -1.7 -1.9 -2.7 -2.3 -2.3 -2.8 -3.2 -3.7 -3.2 -3.6 -3.5 -2.4 -2.4 -1.9 -1.7 -2.0 -3.0 -2.6 -3.3 -2.9 -3.1 -2.6 -3.4 -3.0 -2.9 -2.8 -2.2 -1.9 -1.6 -1.7 -1.8 -1.6 -1.5 -3.4 -3.9
-3.1 -2.5 -2.3 -2.7 -2.9 -2.8 -2.6 -2.5 -2.6 -3.1 -4.2 -4.3 -3.4 -2.8 -2.6 -2.9 -2.4 -2.6 -3.3 -3.5 -3.0 -3.6 -3.0 -3.4 -3.0 -2.6 -2.8 -2.3 -2.2 -2.1 -2.1 -2.1 -2.1 -2.1 -2.2 -2.8
-2.0 -1.6 -1.5 -2.0 -1.8 -2.5 -2.6 -2.9 -3.0 -2.9 -3.3 -3.3 -2.5 -2.5 -2.6 -2.4 -2.6 -3.0 -2.9 -3.1 -3.0 -2.7 -2.1 -2.0 -2.3 -1.8 -1.6 -1.5 -1.6 -1.4 -.8 -1.0 -1.2 -1.8 -2.2
-1.2 -1.2 -1.3 -1.5 -1.6 -2.1 -3.0 -3.6 -3.5 -3.1 -3.5 -3.2 -2.9 -2.0 -1.7 -1.3 -1.1 -1.0 -1.2 -1.4 -1.5 -1.4 -1.2 -.8 -1.1 -1.1 -.8 -.7 -.7 -.5 -.4 .0 .2 .2 -.6 -1.1
-.9 -.8 -.9 .6 -1.0 -1.4 -1.7 -1.3 -1.0 -.8 -.9 -1.0 -.8 -.6 -.3 -.2 -.2 -.3 -.5 -.6 -.7 -1.0 -1.1 -1.3 -1.3 -1.3 -1.2 -1.1 -.9 -.7 -.6 -.5 -.7 -.7 -1.3 -1.3

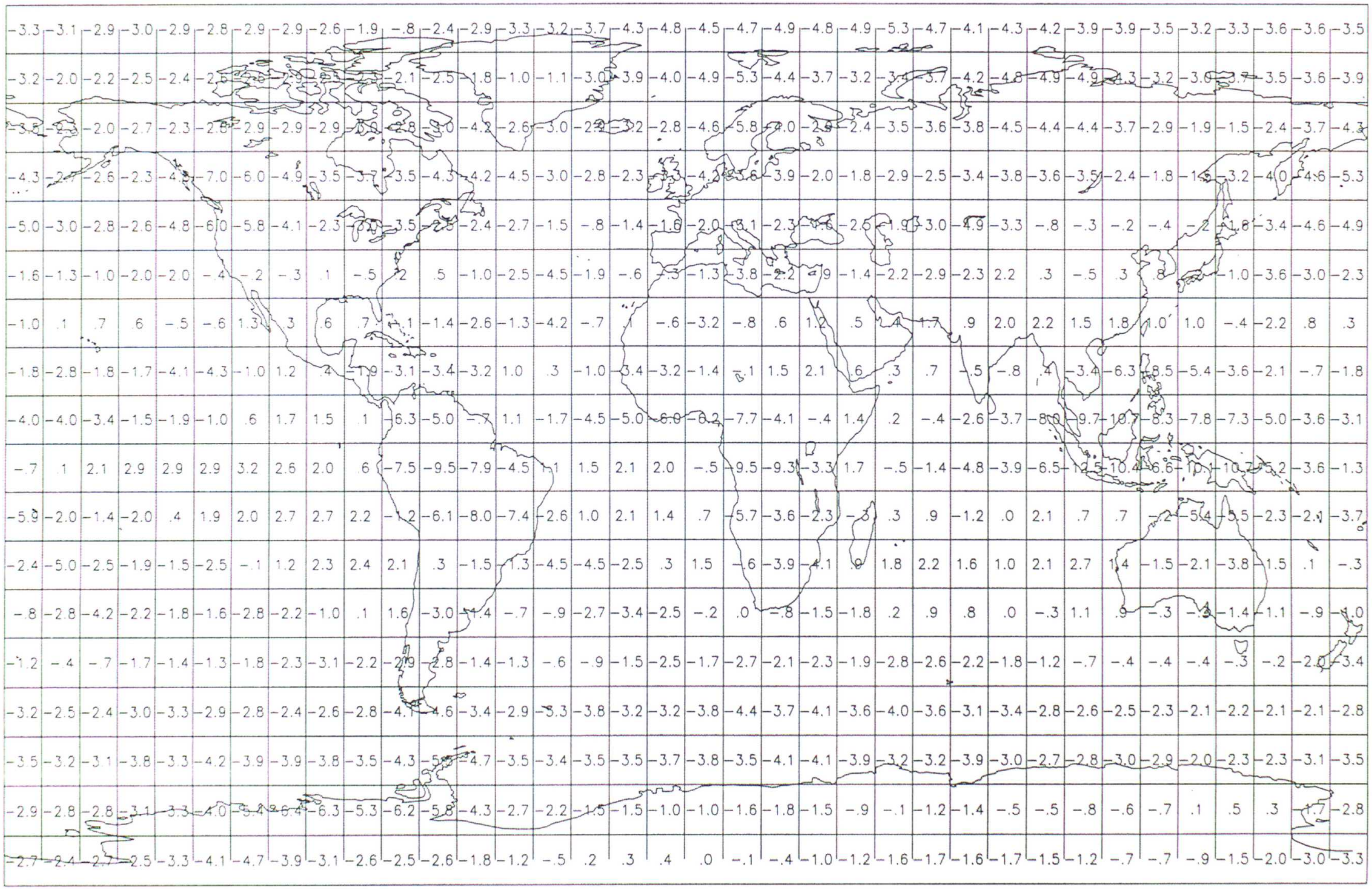
ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : HIRS15 channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 29



1.5	1.3	1.2	1.3	1.2	1.0	1.0	1.2	1.5	2.0	2.3	1.9	2.2	2.6	3.1	2.9	3.1	3.8	3.8	4.1	4.6	4.4	4.4	4.1	3.6	2.6	2.4	2.2	1.6	1.4	1.3	1.4	1.4	1.4	1.5	1.6
2.5	1.7	1.6	1.8	1.6	1.4	[illegible]	1.7	1.8	[illegible]	2.1	2.2	2.8	3.2	2.8	3.7	3.7	4.0	4.8	5.4	4.9	4.3	3.9	4.0	4.1	4.2	3.8	3.1	2.8	2.1	1.6	1.5	1.4	1.7	2.1	2.8
3.1	2.4	2.6	3.5	3.1	3.0	2.9	2.7	2.1	2.1	4.8	3.1	3.8	4.9	5.0	4.1	4.7	4.8	5.8	5.9	4.9	4.8	3.2	3.4	3.3	3.4	3.6	3.7	3.4	2.4	1.8	1.9	1.9	2.5	3.5	4.0
4.8	3.8	3.8	3.7	5.1	6.4	6.2	5.6	4.3	3.9	3.6	5.1	5.1	5.9	5.1	5.3	5.4	5.9	6.0	5.0	4.9	3.9	3.4	3.7	3.8	3.9	4.4	4.5	3.8	3.2	2.3	2.4	3.3	4.0	5.2	5.8
7.0	5.8	5.6	5.6	7.3	7.3	6.7	6.0	4.7	5.0	5.6	5.6	6.1	6.5	6.1	5.1	5.6	4.9	4.5	5.7	6.0	5.8	5.5	4.5	5.3	6.5	5.8	4.3	3.9	3.7	3.6	3.1	4.5	6.9	7.3	7.6
6.5	5.8	5.0	6.0	6.7	5.4	4.1	3.2	2.8	5.0	4.5	5.2	6.8	8.3	9.6	6.6	4.8	3.8	4.8	7.5	6.9	5.5	5.4	5.7	5.6	6.0	5.8	4.9	5.0	5.1	4.5	4.0	7.2	9.1	8.3	7.4
8.6	6.0	4.0	3.8	5.9	5.1	3.4	2.8	3.0	5.6	7.0	8.0	8.3	7.5	9.2	5.5	3.7	5.0	6.6	4.0	2.1	2.2	2.7	3.0	2.5	2.9	2.9	3.4	4.4	3.8	5.1	5.2	8.2	10.4	5.3	6.5
8.5	8.9	7.1	7.4	8.9	8.8	6.0	3.8	4.2	3.9	10.3	11.0	9.9	5.9	6.5	6.9	7.2	5.9	4.1	2.5	1.1	1.7	3.4	4.6	5.3	6.6	7.8	6.9	9.9	11.7	12.9	11.3	10.0	9.4	7.4	9.1
10.5	10.6	10.1	8.0	8.1	7.2	5.1	2.8	3.9	5.8	10.4	10.5	7.3	6.1	8.8	10.8	10.1	10.5	10.6	12.3	10.8	6.9	5.4	7.0	8.1	9.1	9.6	10.9	11.4	11.7	11.7	12.0	11.0	10.5	10.3	9.3
6.4	6.7	3.8	2.5	1.3	.6	.5	.6	.8	3.1	11.9	12.8	11.3	9.3	3.0	3.3	2.3	1.4	5.2	12.1	11.8	8.7	5.0	7.9	8.8	10.5	10.1	11.2	12.3	12.0	10.5	11.6	12.1	9.8	9.6	7.4
11.2	8.3	7.5	8.6	6.8	3.2	1.6	1.0	.8	1.6	7.7	12.0	11.6	10.5	8.1	4.0	1.9	1.6	1.1	10.2	9.6	8.4	6.4	4.4	4.9	7.6	6.0	2.7	4.3	5.6	6.6	10.3	10.1	9.4	9.2	9.4
7.5	9.6	7.3	6.6	6.6	8.0	5.3	3.4	1.7	1.1	1.0	6.8	7.1	7.2	9.0	7.9	6.4	3.7	2.5	7.1	9.0	9.7	4.6	2.4	1.5	3.1	5.3	2.8	1.3	3.2	6.5	7.5	8.1	6.5	4.8	5.9
6.2	7.7	7.6	6.2	5.7	5.9	7.0	6.0	4.6	4.1	3.1	8.2	5.7	5.5	5.7	7.0	7.6	6.6	3.8	4.5	6.0	6.8	6.5	4.5	3.6	3.3	4.7	4.9	3.5	4.0	4.8	4.9	5.1	6.1	6.0	5.9
5.1	4.4	4.8	5.1	4.2	3.9	4.3	4.6	5.2	5.3	5.8	6.6	5.0	4.8	4.2	4.0	4.4	4.7	3.8	4.8	5.0	5.3	5.0	5.8	5.3	4.8	4.3	3.7	3.7	3.3	3.4	3.3	3.6	3.4	5.6	6.1
4.5	3.9	4.2	4.1	3.8	3.3	3.3	3.3	3.6	4.2	5.1	5.8	5.2	4.5	4.3	4.2	3.9	3.8	3.7	3.8	3.6	4.4	3.9	4.3	4.2	3.8	3.9	3.3	3.4	3.1	3.0	3.0	2.9	3.0	3.4	4.1
2.9	2.7	2.4	2.6	2.5	2.7	2.6	2.9	3.0	3.4	4.0	4.5	4.7	4.1	3.8	3.2	3.2	2.5	2.8	3.0	3.5	3.5	3.5	3.4	3.0	2.9	2.7	2.9	3.0	2.8	2.3	2.3	2.3	2.2	2.6	2.9
1.7	1.7	2.0	2.5	2.7	3.3	3.6	4.5	4.1	3.6	4.1	4.0	3.2	2.6	2.4	2.5	2.6	2.2	2.2	2.3	2.1	1.8	1.5	1.3	1.9	1.9	1.3	1.2	1.1	1.0	1.0	1.1	1.3	1.8	2.5	1.8
2.2	2.1	2.4	2.6	3.0	3.3	3.4	3.0	2.5	2.1	2.1	2.1	1.7	1.5	1.3	1.2	1.1	1.0	.8	.8	.8	.8	.8	.8	.8	.9	.9	.9	.9	.9	1.1	1.4	1.8	2.7	2.7	2.7

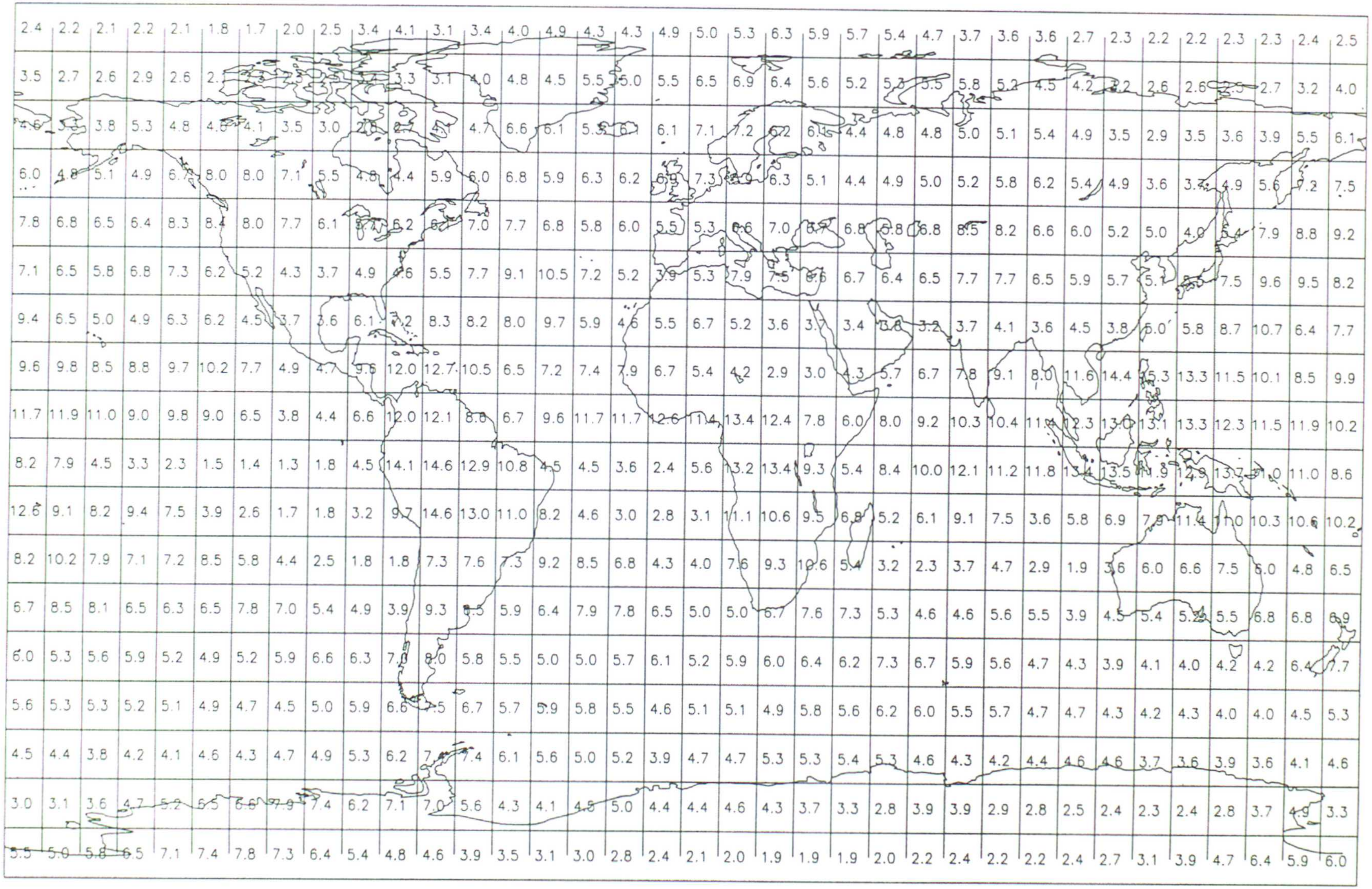
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 30
NOVEMBER 1999 : HIRS11 Channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS



-3.3	-3.1	-2.9	-3.0	-2.9	-2.8	-2.9	-2.9	-2.6	-1.9	-.8	-2.4	-2.9	-3.3	-3.2	-3.7	-4.3	-4.8	-4.5	-4.7	-4.9	-4.8	-4.9	-5.3	-4.7	-4.1	-4.3	-4.2	-3.9	-3.9	-3.5	-3.2	-3.3	-3.6	-3.6	-3.5
-3.2	-2.0	-2.2	-2.5	-2.4	-2.5	-2.6	-2.9	[illegible]	[illegible]	-2.1	-2.5	-1.8	-1.0	-1.1	-3.0	-3.9	-4.0	-4.9	-5.3	-4.4	-3.7	-3.2	-3.4	-3.7	-4.2	-4.8	-4.9	-4.9	-4.3	-3.2	-3.0	-3.7	-3.5	-3.6	-3.9
-3.5	-2.3	-2.0	-2.7	-2.3	-2.8	-2.9	-2.9	-2.9	-3.0	-2.8	-3.0	-4.2	-2.6	-3.0	-2.2	-3.2	-2.8	-4.6	-5.8	-4.0	-2.9	-2.4	-3.5	-3.6	-3.8	-4.5	-4.4	-4.4	-3.7	-2.9	-1.9	-1.5	-2.4	-3.7	-4.3
-4.3	-2.7	-2.6	-2.3	-4.3	-7.0	-6.0	-4.9	-3.5	-3.7	-3.5	-4.3	-4.2	-4.5	-3.0	-2.8	-2.3	-3.3	-4.2	-3.6	-3.9	-2.0	-1.8	-2.9	-2.5	-3.4	-3.8	-3.6	-3.5	-2.4	-1.8	-1.5	-3.2	-4.0	-4.6	-5.3
-5.0	-3.0	-2.8	-2.6	-4.8	-6.0	-5.8	-4.1	-2.3	[illegible]	-3.5	-2.5	-2.4	-2.7	-1.5	-.8	-1.4	-1.6	-2.0	-3.1	-2.3	-1.6	-2.6	-1.9	-3.0	-4.9	-3.3	-.8	-.3	-.2	-.4	-.2	-1.8	-3.4	-4.6	-4.9
-1.6	-1.3	-1.0	-2.0	-2.0	-.4	-.2	-.3	.1	-.5	.2	.5	-1.0	-2.5	-4.5	-1.9	-.6	-.3	-1.3	-3.8	-2.2	-.9	-1.4	-2.2	-2.9	-2.3	2.2	.3	-.5	.3	.8		-1.0	-3.6	-3.0	-2.3
-1.0	.1	.7	.6	-.5	-.6	1.3	.3	.6	.7	-.1	-1.4	-2.6	-1.3	-4.2	-.7	.1	-.6	-3.2	-.8	.6	1.2	.5	.4	1.7	.9	2.0	2.2	1.5	1.8	1.0	1.0	-.4	-2.2	.8	.3
-1.8	-2.8	-1.8	-1.7	-4.1	-4.3	-1.0	1.2	.4	-1.9	-3.1	-3.4	-3.2	1.0	.3	-1.0	-3.4	-3.2	-1.4	-.1	1.5	2.1	.6	.3	.7	-.5	-.8	.4	-3.4	-6.3	-8.5	-5.4	-3.6	-2.1	-.7	-1.8
-4.0	-4.0	-3.4	-1.5	-1.9	-1.0	.6	1.7	1.5	.1	-6.3	-5.0	-.7	1.1	-1.7	-4.5	-5.0	-6.0	-6.2	-7.7	-4.1	-.4	1.4	.2	-.4	-2.6	-3.7	-8.0	-9.7	-10.7	-8.3	-7.8	-7.3	-5.0	-3.6	-3.1
-.7	.1	2.1	2.9	2.9	2.9	3.2	2.6	2.0	.6	-7.5	-9.5	-7.9	-4.5	1.1	1.5	2.1	2.0	-.5	-9.5	-9.3	-3.3	1.7	-.5	-1.4	-4.8	-3.9	-6.5	-12.5	-10.4	-6.6	-10.1	-10.7	-5.2	-3.6	-1.3
-5.9	-2.0	-1.4	-2.0	.4	1.9	2.0	2.7	2.7	2.2	-1.2	-6.1	-8.0	-7.4	-2.6	1.0	2.1	1.4	.7	-5.7	-3.6	-2.3	-.3	.3	.9	-1.2	.0	2.1	.7	.7	-.2	-5.4	-5.5	-2.3	-2.1	-3.7
-2.4	-5.0	-2.5	-1.9	-1.5	-2.5	-.1	1.2	2.3	2.4	2.1	.3	-1.5	-1.3	-4.5	-4.5	-2.5	.3	1.5	-.6	-3.9	-4.1	.9	1.8	2.2	1.6	1.0	2.1	2.7	1.4	-1.5	-2.1	-3.8	-1.5	.1	-.3
-.8	-2.8	-4.2	-2.2	-1.8	-1.6	-2.8	-2.2	-1.0	.1	1.6	-3.0	-1.4	-.7	-.9	-2.7	-3.4	-2.5	-.2	.0	-.8	-1.5	-1.8	.2	.9	.8	.0	-.3	1.1	.9	-.3	-.3	-1.4	-1.1	-.9	-1.0
-1.2	-.4	-.7	-1.7	-1.4	-1.3	-1.8	-2.3	-3.1	-2.2	-2.9	-2.8	-1.4	-1.3	-.6	-.9	-1.5	-2.5	-1.7	-2.7	-2.1	-2.3	-1.9	-2.8	-2.6	-2.2	-1.8	-1.2	-.7	-.4	-.4	-.4	-.3	-.2	-2.0	-3.4
-3.2	-2.5	-2.4	-3.0	-3.3	-2.9	-2.8	-2.4	-2.6	-2.8	-4.1	-4.6	-3.4	-2.9	-3.3	-3.8	-3.2	-3.2	-3.8	-4.4	-3.7	-4.1	-3.6	-4.0	-3.6	-3.1	-3.4	-2.8	-2.6	-2.5	-2.3	-2.1	-2.2	-2.1	-2.1	-2.8
-3.5	-3.2	-3.1	-3.8	-3.3	-4.2	-3.9	-3.9	-3.8	-3.5	-4.3	-5.5	-4.7	-3.5	-3.4	-3.5	-3.5	-3.7	-3.8	-3.5	-4.1	-4.1	-3.9	-3.2	-3.2	-3.9	-3.0	-2.7	-2.8	-3.0	-2.9	-2.0	-2.3	-2.3	-3.1	-3.5
-2.9	-2.8	-2.8	-3.1	-3.3	-4.0	-5.4	-6.4	-6.3	-5.3	-6.2	-5.8	-4.3	-2.7	-2.2	-1.5	-1.5	-1.0	-1.0	-1.6	-1.8	-1.5	-.9	-.1	-1.2	-1.4	-.5	-.5	-.8	-.6	-.7	.1	.5	.3	-1.7	-2.8
-2.7	-2.4	-2.7	-2.5	-3.3	-4.1	-4.7	-3.9	-3.1	-2.6	-2.5	-2.6	-1.8	-1.2	-.5	.2	.3	.4	.0	-.1	-.4	-1.0	-1.2	-1.6	-1.7	-1.6	-1.7	-1.5	-1.2	-.7	-.7	-.9	-1.5	-2.0	-3.0	-3.3

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : HIRS11 channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 31



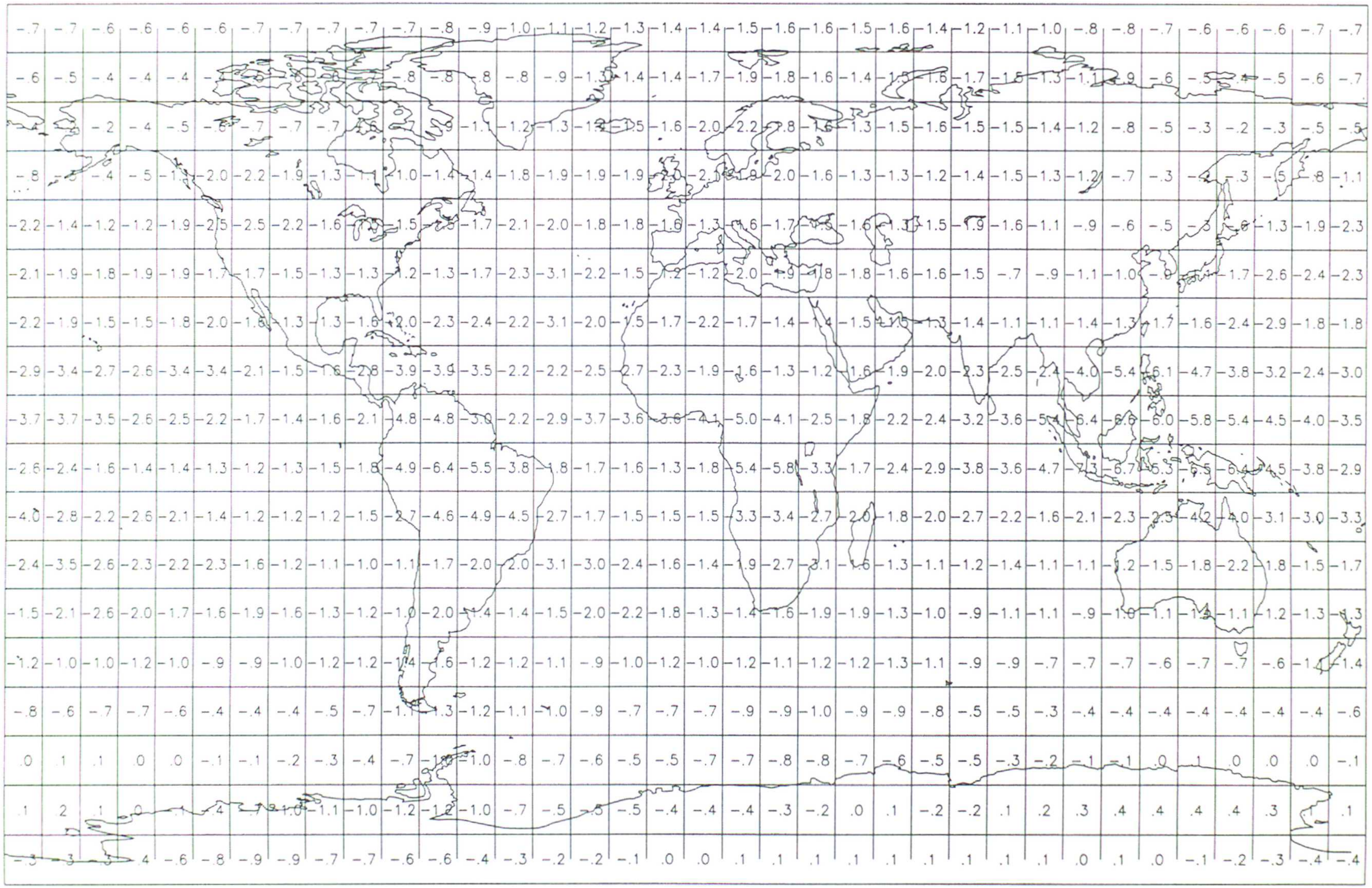
2.4	2.2	2.1	2.2	2.1	1.8	1.7	2.0	2.5	3.4	4.1	3.1	3.4	4.0	4.9	4.3	4.3	4.9	5.0	5.3	6.3	5.9	5.7	5.4	4.7	3.7	3.6	3.6	2.7	2.3	2.2	2.2	2.3	2.3	2.4	2.5
3.5	2.7	2.6	2.9	2.6	2.1	2.3	2.5	[illegible]	3.4	3.3	3.1	4.0	4.8	4.5	5.5	5.0	5.5	6.5	6.9	6.4	5.6	5.2	5.3	5.5	5.8	5.2	4.5	4.2	2.2	2.6	2.6	2.5	2.7	3.2	4.0
4.6	3.3	3.8	5.3	4.8	4.6	4.1	3.5	3.0	2.6	2.7	4.1	4.7	6.6	6.1	5.3	6.1	6.1	7.1	7.2	6.2	6.1	4.4	4.8	4.8	5.0	5.1	5.4	4.9	3.5	2.9	3.5	3.6	3.9	5.5	6.1
6.0	4.8	5.1	4.9	6.7	8.0	8.0	7.1	5.5	4.8	4.4	5.9	6.0	6.8	5.9	6.3	6.2	6.9	7.3	5.9	6.3	5.1	4.4	4.9	5.0	5.2	5.8	6.2	5.4	4.9	3.6	3.7	4.9	5.6	7.2	7.5
7.8	6.8	6.5	6.4	8.3	8.4	8.0	7.7	6.1	3.7	6.2	6.1	7.0	7.7	6.8	5.8	6.0	5.5	5.3	6.6	7.0	6.7	6.8	5.8	6.8	8.5	8.2	6.6	6.0	5.2	5.0	4.0	5.4	7.9	8.8	9.2
7.1	6.5	5.8	6.8	7.3	6.2	5.2	4.3	3.7	4.9	4.6	5.5	7.7	9.1	10.5	7.2	5.2	3.9	5.3	7.9	7.5	6.6	6.7	6.4	6.5	7.7	7.7	6.5	5.9	5.7	5.1	[illegible]	7.5	9.6	9.5	8.2
9.4	6.5	5.0	4.9	6.3	6.2	4.5	3.7	3.6	6.1	7.2	8.3	8.2	8.0	9.7	5.9	4.6	5.5	6.7	5.2	3.6	3.7	3.4	3.8	3.2	3.7	4.1	3.6	4.5	3.8	5.0	5.8	8.7	10.7	6.4	7.7
9.6	9.8	8.5	8.8	9.7	10.2	7.7	4.9	4.7	9.6	12.0	12.7	10.5	6.5	7.2	7.4	7.9	6.7	5.4	4.2	2.9	3.0	4.3	5.7	6.7	7.8	9.1	8.0	11.6	14.4	15.3	13.3	11.5	10.1	8.5	9.9
11.7	11.9	11.0	9.0	9.8	9.0	6.5	3.8	4.4	6.6	12.0	12.1	8.6	6.7	9.6	11.7	11.7	12.6	11.4	13.4	12.4	7.8	6.0	8.0	9.2	10.3	10.4	11.4	12.3	13.0	13.1	13.3	12.3	11.5	11.9	10.2
8.2	7.9	4.5	3.3	2.3	1.5	1.4	1.3	1.8	4.5	14.1	14.6	12.9	10.8	4.5	4.5	3.6	2.4	5.6	13.2	13.4	9.3	5.4	8.4	10.0	12.1	11.2	11.8	13.4	13.5	11.9	12.9	13.7	11.0	11.0	8.6
12.6	9.1	8.2	9.4	7.5	3.9	2.6	1.7	1.8	3.2	9.7	14.6	13.0	11.0	8.2	4.6	3.0	2.8	3.1	11.1	10.6	9.5	6.8	5.2	6.1	9.1	7.5	3.6	5.8	6.9	7.9	11.4	11.0	10.3	10.6	10.2
8.2	10.2	7.9	7.1	7.2	8.5	5.8	4.4	2.5	1.8	1.8	7.3	7.6	7.3	9.2	8.5	6.8	4.3	4.0	7.6	9.3	10.6	5.4	3.2	2.3	3.7	4.7	2.9	1.9	3.6	6.0	6.6	7.5	6.0	4.8	6.5
6.7	8.5	8.1	6.5	6.3	6.5	7.8	7.0	5.4	4.9	3.9	9.3	[illegible]	5.9	6.4	7.9	7.8	6.5	5.0	5.0	6.7	7.6	7.3	5.3	4.6	4.6	5.6	5.5	3.9	4.5	5.4	5.2	5.5	6.8	6.8	6.9
6.0	5.3	5.6	5.9	5.2	4.9	5.2	5.9	6.6	6.3	7.0	8.0	5.8	5.5	5.0	5.0	5.7	6.1	5.2	5.9	6.0	6.4	6.2	7.3	6.7	5.9	5.6	4.7	4.3	3.9	4.1	4.0	4.2	4.2	6.4	7.7
5.6	5.3	5.3	5.2	5.1	4.9	4.7	4.5	5.0	5.9	6.6	7.5	6.7	5.7	5.9	5.8	5.5	4.6	5.1	5.1	4.9	5.8	5.6	6.2	6.0	5.5	5.7	4.7	4.7	4.3	4.2	4.3	4.0	4.0	4.5	5.3
4.5	4.4	3.8	4.2	4.1	4.6	4.3	4.7	4.9	5.3	6.2	[illegible]	7.4	6.1	5.6	5.0	5.2	3.9	4.7	4.7	5.3	5.3	5.4	5.3	4.6	4.3	4.2	4.4	4.6	4.6	3.7	3.6	3.9	3.6	4.1	4.6
3.0	3.1	3.6	4.7	5.2	6.5	6.6	7.9	7.4	6.2	7.1	7.0	5.6	4.3	4.1	4.5	5.0	4.4	4.4	4.6	4.3	3.7	3.3	2.8	3.9	3.9	2.9	2.8	2.5	2.4	2.3	2.4	2.8	3.7	4.9	3.3
5.5	5.0	5.8	6.5	7.1	7.4	7.8	7.3	6.4	5.4	4.8	4.6	3.9	3.5	3.1	3.0	2.8	2.4	2.1	2.0	1.9	1.9	1.9	2.0	2.2	2.4	2.2	2.2	2.4	2.7	3.1	3.9	4.7	6.4	5.9	6.0

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

FIGURE 32

NOVEMBER 1999 : HIRS4 channel (400 hPa)

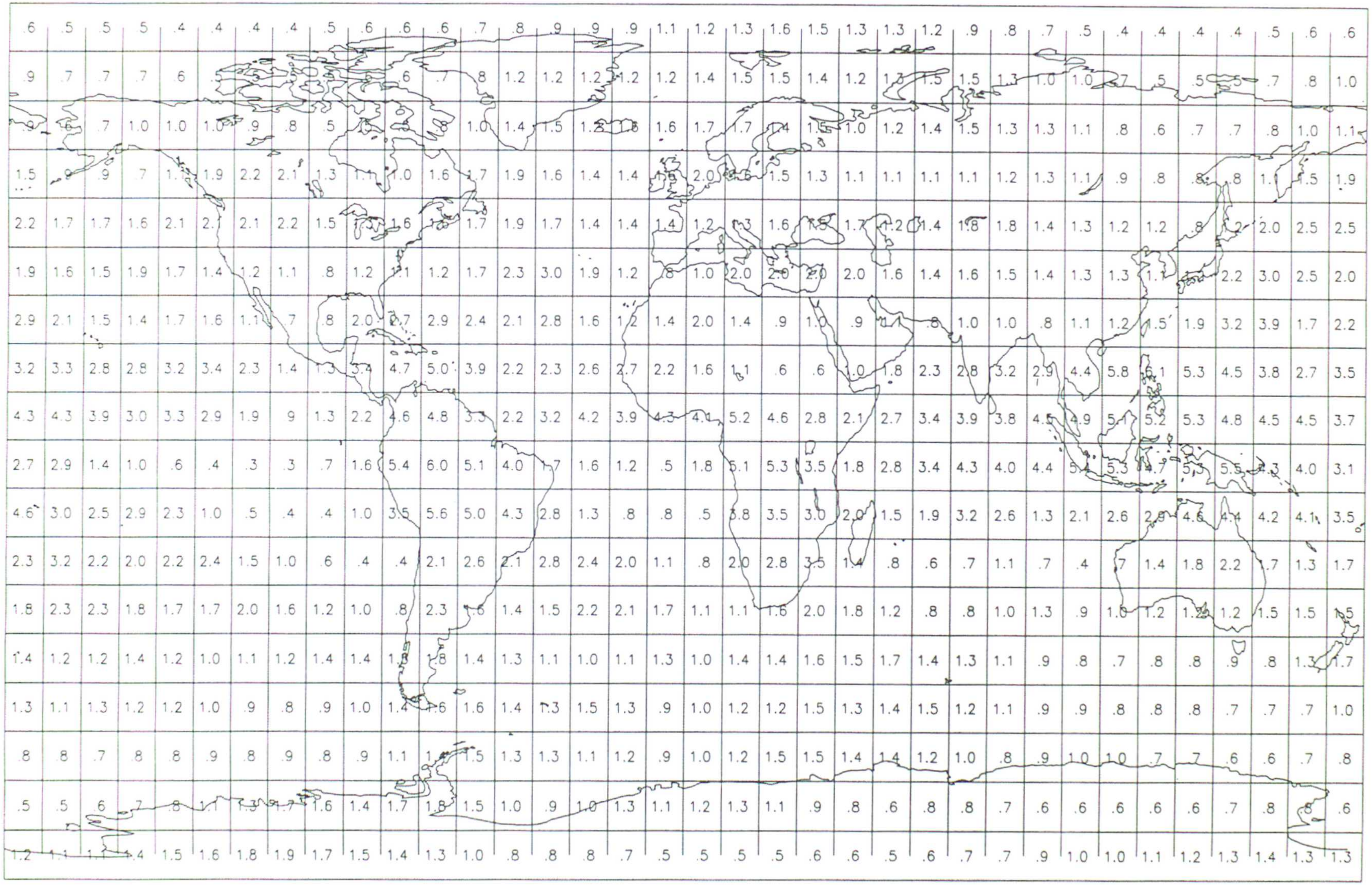
NOAA–15, USING ALL OBSERVATIONS



-.7 -.7 -.6 -.6 -.6 -.6 -.7 -.7 -.7 -.7 -.7 -.8 -.9 -1.0 -1.1 -1.2 -1.3 -1.4 -1.4 -1.5 -1.6 -1.6 -1.5 -1.6 -1.4 -1.2 -1.1 -1.0 -.8 -.8 -.7 -.6 -.6 -.6 -.7 -.7
-.6 -.5 -.4 -.4 -.4 [illegible] [illegible] [illegible] [illegible] [illegible] -.8 -.8 .8 -.8 -.9 -1.3 -1.4 -1.4 -1.7 -1.9 -1.8 -1.6 -1.4 -1.5 -1.6 -1.7 -1.5 -1.3 -1.1 -.9 -.6 -.5 -.4 -.5 -.6 -.7
-.4 -.3 -.2 -.4 -.5 -.6 -.7 -.7 -.7 -.6 -.7 -.9 -1.1 -1.2 -1.3 -1.3 -1.5 -1.6 -2.0 -2.2 -2.8 -1.6 -1.3 -1.5 -1.6 -1.5 -1.5 -1.4 -1.2 -.8 -.5 -.3 -.2 -.3 -.5 -.5
-.8 -.3 -.4 -.5 [illegible] -2.0 -2.2 -1.9 -1.3 -1.1 -1.0 -1.4 -1.4 -1.8 -1.9 -1.9 -1.9 -2.0 -2.1 -1.9 -2.0 -1.6 -1.3 -1.3 -1.2 -1.4 -1.5 -1.3 -1.2 -.7 -.3 -.2 -.3 -.5 -.8 -1.1
-2.2 -1.4 -1.2 -1.2 -1.9 -2.5 -2.5 -2.2 -1.6 [illegible] -1.5 [illegible] -1.7 -2.1 -2.0 -1.8 -1.8 -1.6 -1.3 -1.6 -1.7 -1.5 -1.6 -1.3 -1.5 -1.9 -1.6 -1.1 -.9 -.6 -.5 -.3 -.6 -1.3 -1.9 -2.3
-2.1 -1.9 -1.8 -1.9 -1.9 -1.7 -1.7 -1.5 -1.3 -1.3 -1.2 -1.3 -1.7 -2.3 -3.1 -2.2 -1.5 -1.2 -1.2 -2.0 -1.9 -1.8 -1.8 -1.6 -1.6 -1.5 -.7 -.9 -1.1 -1.0 -.9 [illegible] -1.7 -2.6 -2.4 -2.3
-2.2 -1.9 -1.5 -1.5 -1.8 -2.0 -1.6 -1.3 -1.3 -1.6 -2.0 -2.3 -2.4 -2.2 -3.1 -2.0 -1.5 -1.7 -2.2 -1.7 -1.4 -1.4 -1.5 -1.5 -1.3 -1.4 -1.1 -1.1 -1.4 -1.3 -1.7 -1.6 -2.4 -2.9 -1.8 -1.8
-2.9 -3.4 -2.7 -2.6 -3.4 -3.4 -2.1 -1.5 -1.6 -2.8 -3.9 -3.9 -3.5 -2.2 -2.2 -2.5 -2.7 -2.3 -1.9 -1.6 -1.3 -1.2 -1.6 -1.9 -2.0 -2.3 -2.5 -2.4 -4.0 -5.4 -6.1 -4.7 -3.8 -3.2 -2.4 -3.0
-3.7 -3.7 -3.5 -2.6 -2.5 -2.2 -1.7 -1.4 -1.6 -2.1 -4.8 -4.8 -3.0 -2.2 -2.9 -3.7 -3.6 -3.6 -4.1 -5.0 -4.1 -2.5 -1.8 -2.2 -2.4 -3.2 -3.6 -5.4 -6.4 -6.6 -6.0 -5.8 -5.4 -4.5 -4.0 -3.5
-2.6 -2.4 -1.6 -1.4 -1.4 -1.3 -1.2 -1.3 -1.5 -1.8 -4.9 -6.4 -5.5 -3.8 -1.8 -1.7 -1.6 -1.3 -1.8 -5.4 -5.8 -3.3 -1.7 -2.4 -2.9 -3.8 -3.6 -4.7 -7.3 -6.7 -5.3 -6.5 -6.4 -4.5 -3.8 -2.9
-4.0 -2.8 -2.2 -2.6 -2.1 -1.4 -1.2 -1.2 -1.2 -1.5 -2.7 -4.6 -4.9 -4.5 -2.7 -1.7 -1.5 -1.5 -1.5 -3.3 -3.4 -2.7 -2.0 -1.8 -2.0 -2.7 -2.2 -1.6 -2.1 -2.3 -2.3 -4.2 -4.0 -3.1 -3.0 -3.3
-2.4 -3.5 -2.6 -2.3 -2.2 -2.3 -1.6 -1.2 -1.1 -1.0 -1.1 -1.7 -2.0 -2.0 -3.1 -3.0 -2.4 -1.6 -1.4 -1.9 -2.7 -3.1 -1.6 -1.3 -1.1 -1.2 -1.4 -1.1 -1.1 -1.2 -1.5 -1.8 -2.2 -1.8 -1.5 -1.7
-1.5 -2.1 -2.6 -2.0 -1.7 -1.6 -1.9 -1.6 -1.3 -1.2 -1.0 -2.0 -1.4 -1.4 -1.5 -2.0 -2.2 -1.8 -1.3 -1.4 -1.6 -1.9 -1.9 -1.3 -1.0 -.9 -1.1 -1.1 -.9 -1.0 -1.1 -1.3 -1.1 -1.2 -1.3 -1.3
-1.2 -1.0 -1.0 -1.2 -1.0 -.9 -.9 -1.0 -1.2 -1.2 -1.4 -1.6 -1.2 -1.2 -1.1 -.9 -1.0 -1.2 -1.0 -1.2 -1.1 -1.2 -1.2 -1.3 -1.1 -.9 -.9 -.7 -.7 -.7 -.6 -.7 -.7 -.6 -1.4 -1.4
-.8 -.6 -.7 -.7 -.6 -.4 -.4 -.4 -.5 -.7 -1.1 -1.3 -1.2 -1.1 -1.0 -.9 -.7 -.7 -.7 -.9 -.9 -1.0 -.9 -.9 -.8 -.5 -.5 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.6
.0 .1 .1 .0 .0 -.1 -.1 -.2 -.3 -.4 -.7 -1.0 -1.0 -.8 -.7 -.6 -.5 -.5 -.7 -.7 -.8 -.8 -.7 -.6 -.5 -.5 -.3 -.2 -.1 -.1 .0 .1 .0 .0 .0 -.1
.1 .2 .1 .0 -.1 -.4 -.7 -1.0 -1.1 -1.0 -1.2 -1.2 -1.0 -.7 -.5 -.5 -.5 -.4 -.4 -.4 -.3 -.2 .0 .1 -.2 -.2 .1 .2 .3 .4 .4 .4 .4 .3 .1 .1
-.3 -.3 -.3 -.4 -.6 -.8 -.9 -.9 -.7 -.7 -.6 -.6 -.4 -.3 -.2 -.2 -.1 .0 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .0 -.1 -.2 -.3 -.4 -.4

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

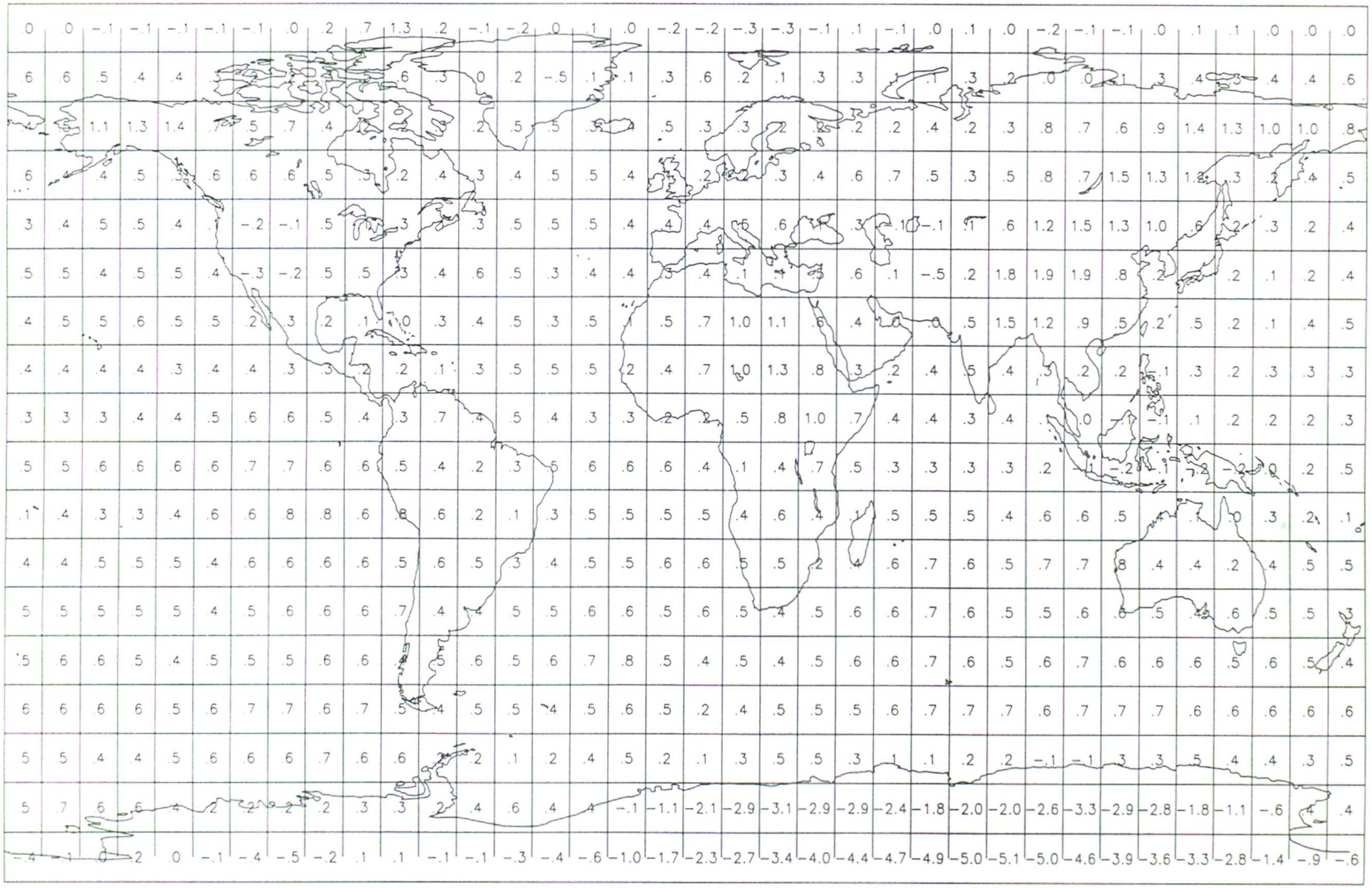
FIGURE 33



.6 .5 .5 .5 .4 .4 .4 .4 .5 .6 .6 .6 .7 .8 .9 .9 .9 1.1 1.2 1.3 1.6 1.5 1.3 1.3 1.2 .9 .8 .7 .5 .4 .4 .4 .4 .5 .6 .6
.9 .7 .7 .7 .6 .5 .6 .7 .8 1.2 1.2 1.2 1.2 1.2 1.4 1.5 1.5 1.4 1.2 1.3 1.5 1.5 1.3 1.0 1.0 .7 .5 .5 .5 .7 .8 1.0
.9 .6 .7 1.0 1.0 1.0 .9 .8 .5 .8 1.0 1.4 1.5 1.2 1.6 1.6 1.7 1.7 1.4 1.5 1.0 1.2 1.4 1.5 1.3 1.3 1.1 .8 .6 .7 .7 .8 1.0 1.1
1.5 .9 .9 .7 1.9 2.2 2.1 1.3 1.1 1.0 1.6 1.7 1.9 1.6 1.4 1.4 2.0 1.5 1.3 1.1 1.1 1.1 1.1 1.2 1.3 1.1 .9 .8 .8 .8 1.1 1.5 1.9
2.2 1.7 1.7 1.6 2.1 2.1 2.1 2.2 1.5 1.6 1.7 1.9 1.7 1.4 1.4 1.4 1.2 1.3 1.6 1.5 1.7 1.2 1.4 1.8 1.8 1.4 1.3 1.2 1.2 .8 1.2 2.0 2.5 2.5
1.9 1.6 1.5 1.9 1.7 1.4 1.2 1.1 .8 1.2 1.1 1.2 1.7 2.3 3.0 1.9 1.2 .8 1.0 2.0 2.0 2.0 2.0 1.6 1.4 1.6 1.5 1.4 1.3 1.3 1.1 2.2 3.0 2.5 2.0
2.9 2.1 1.5 1.4 1.7 1.6 1.1 .7 .8 2.0 2.7 2.9 2.4 2.1 2.8 1.6 1.2 1.4 2.0 1.4 .9 1.0 .9 .8 1.0 1.0 .8 1.1 1.2 1.5 1.9 3.2 3.9 1.7 2.2
3.2 3.3 2.8 2.8 3.2 3.4 2.3 1.4 1.3 3.4 4.7 5.0 3.9 2.2 2.3 2.6 2.7 2.2 1.6 1.1 .6 .6 1.0 1.8 2.3 2.8 3.2 2.9 4.4 5.8 6.1 5.3 4.5 3.8 2.7 3.5
4.3 4.3 3.9 3.0 3.3 2.9 1.9 .9 1.3 2.2 4.6 4.8 3.3 2.2 3.2 4.2 3.9 4.3 4.1 5.2 4.6 2.8 2.1 2.7 3.4 3.9 3.8 4.5 4.9 5.1 5.2 5.3 4.8 4.5 4.5 3.7
2.7 2.9 1.4 1.0 .6 .4 .3 .3 .7 1.6 5.4 6.0 5.1 4.0 1.7 1.6 1.2 .5 1.8 5.1 5.3 3.5 1.8 2.8 3.4 4.3 4.0 4.4 5.4 5.3 4.7 5.5 5.5 4.3 4.0 3.1
4.6 3.0 2.5 2.9 2.3 1.0 .5 .4 .4 1.0 3.5 5.6 5.0 4.3 2.8 1.3 .8 .8 .5 3.8 3.5 3.0 2.0 1.5 1.9 3.2 2.6 1.3 2.1 2.6 2.9 4.6 4.4 4.2 4.1 3.5
2.3 3.2 2.2 2.0 2.2 2.4 1.5 1.0 .6 .4 .4 2.1 2.6 2.1 2.8 2.4 2.0 1.1 .8 2.0 2.8 3.5 1.4 .8 .6 .7 1.1 .7 .4 .7 1.4 1.8 2.2 1.7 1.3 1.7
1.8 2.3 2.3 1.8 1.7 1.7 2.0 1.6 1.2 1.0 .8 2.3 1.6 1.4 1.5 2.2 2.1 1.7 1.1 1.1 1.6 2.0 1.8 1.2 .8 .8 1.0 1.3 .9 1.0 1.2 1.2 1.2 1.5 1.5 1.5
1.4 1.2 1.2 1.4 1.2 1.0 1.1 1.2 1.4 1.4 1.3 1.8 1.4 1.3 1.1 1.0 1.1 1.3 1.0 1.4 1.4 1.6 1.5 1.7 1.4 1.3 1.1 .9 .8 .7 .8 .8 .9 .8 1.3 1.7
1.3 1.1 1.3 1.2 1.2 1.0 .9 .8 .9 1.0 1.4 1.6 1.6 1.4 1.3 1.5 1.3 .9 1.0 1.2 1.2 1.5 1.3 1.4 1.5 1.2 1.1 .9 .9 .8 .8 .8 .7 .7 .7 1.0
.8 .8 .7 .8 .8 .9 .8 .9 .8 .9 1.1 1.5 1.3 1.3 1.1 1.2 .9 1.0 1.2 1.5 1.5 1.4 1.4 1.2 1.0 .8 .9 1.0 1.0 .7 .7 .6 .6 .7 .8
.5 .5 .6 .7 .8 1.1 1.3 1.7 1.6 1.4 1.7 1.8 1.5 1.0 .9 1.0 1.3 1.1 1.2 1.3 1.1 .9 .8 .6 .8 .8 .7 .6 .6 .6 .6 .6 .7 .8 .8 .6
1.2 1.1 1.1 1.4 1.5 1.6 1.8 1.9 1.7 1.5 1.4 1.3 1.0 .8 .8 .8 .7 .5 .5 .5 .5 .6 .6 .5 .6 .7 .7 .9 1.0 1.0 1.1 1.2 1.3 1.4 1.3 1.3

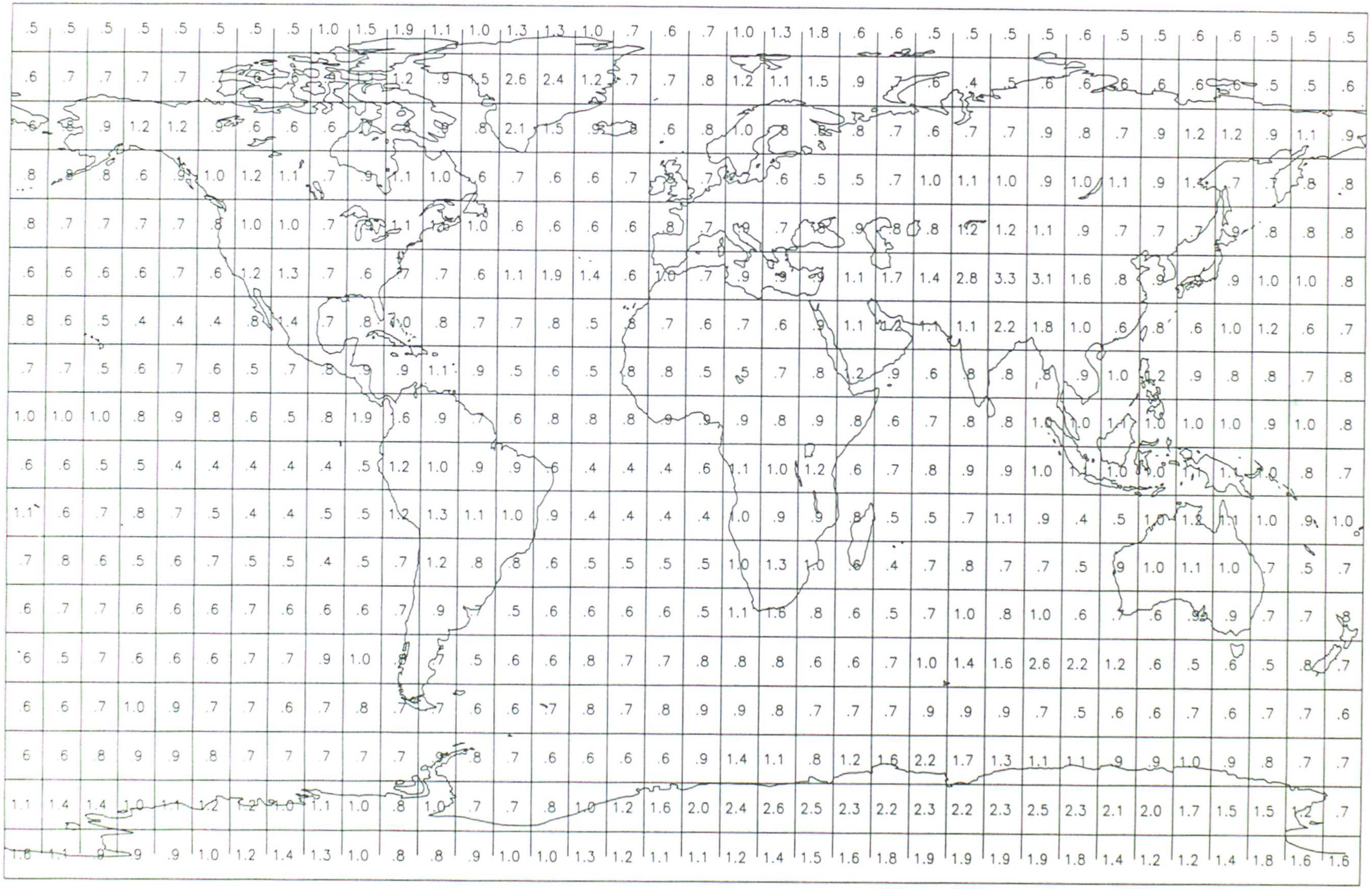
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
NOVEMBER 1999 : AMSUA-5 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 34

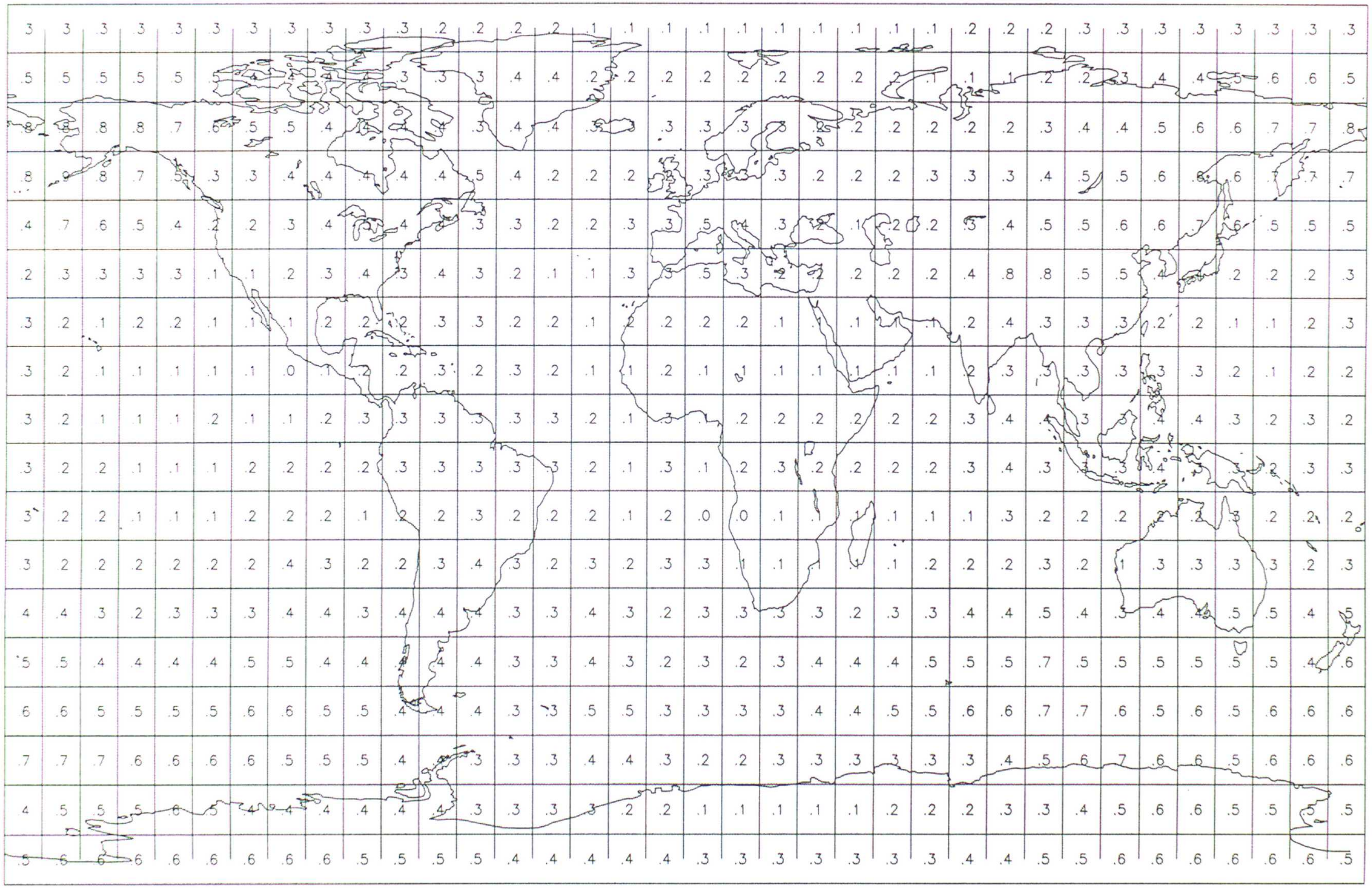

.0 .0 -.1 -.1 -.1 -.1 -.1 .0 .2 .7 1.3 .2 -.1 -.2 .0 .1 .0 -.2 -.2 -.3 -.3 -.1 .1 -.1 .0 .1 .0 -.2 -.1 -.1 .0 .1 .1 .0 .0 .0
.6 .6 .5 .4 .4 .3 .2 [illegible] [illegible] [illegible] .6 .3 0 .2 -.5 .1 .1 .3 .6 .2 .1 .3 .3 .1 .1 .3 .2 .0 .0 .1 .3 .4 .3 .4 .4 .6
.4 .5 1.1 1.3 1.4 .7 .5 .7 .4 [illegible] .2 .3 .2 .5 .5 .3 .4 .5 .3 .3 .2 .2 .2 .2 .4 .2 .3 .8 .7 .6 .9 1.4 1.3 1.0 1.0 .8
.6 .4 .4 .5 .3 .6 .6 .6 .5 .3 .2 .4 .3 .4 .5 .5 .4 [illegible] .2 .2 .3 .4 .6 .7 .5 .3 .5 .8 .7 1.5 1.3 1.2 .3 .2 .4 .5
.3 .4 .5 .5 .4 .1 -.2 -.1 .5 [illegible] .3 [illegible] .3 .5 .5 .5 .4 .4 .4 .5 .6 [illegible] .3 -.1 -.1 .1 .6 1.2 1.5 1.3 1.0 .6 .2 .3 .2 .4
.5 .5 .4 .5 .5 .4 -.3 -.2 .5 .5 .3 .4 .6 .5 .3 .4 .4 .3 .4 .1 .4 .5 .6 .1 -.5 .2 1.8 1.9 1.9 .8 .2 [illegible] .2 .1 .2 .4
.4 .5 .5 .6 .5 .5 .2 .3 .2 .1 .0 .3 .4 .5 .3 .5 .1 .5 .7 1.0 1.1 .6 .4 .0 .0 .5 1.5 1.2 .9 .5 .2 .5 .2 .1 .4 .5
.4 .4 .4 .4 .3 .4 .4 .3 .3 .2 .2 .1 .3 .5 .5 .5 .2 .4 .7 1.0 1.3 .8 .3 .2 .4 .5 .4 .3 .2 .2 -.1 .3 .2 .3 .3 .3
.3 .3 .3 .4 .4 .5 .6 .6 .5 .4 .3 .7 .4 .5 .4 .3 .3 .2 .2 .5 .8 1.0 .7 .4 .4 .3 .4 [illegible] .0 -.1 -.1 .1 .2 .2 .2 .3
.5 .5 .6 .6 .6 .6 .7 .7 .6 .6 .5 .4 .2 .3 .5 .6 .6 .6 .4 .1 .4 .7 .5 .3 .3 .3 .3 .2 -.1 -.2 -.1 .2 -.2 .0 .2 .5
.1 .4 .3 .3 .4 .6 .6 .8 .8 .6 .8 .6 .2 .1 .3 .5 .5 .5 .5 .4 .6 .4 .1 .5 .5 .5 .4 .6 .6 .5 .4 .1 .0 .3 .2 .1
.4 .4 .5 .5 .5 .4 .6 .6 .6 .6 .5 .6 .5 .3 .4 .5 .5 .6 .6 .5 .5 .2 .4 .6 .7 .6 .5 .7 .7 .8 .4 .4 .2 .4 .5 .5
.5 .5 .5 .5 .5 .4 .5 .6 .6 .6 .7 .4 .4 .5 .5 .6 .6 .5 .6 .5 .4 .5 .6 .6 .7 .6 .5 .5 .6 .6 .5 .4 .6 .5 .5 .3
.5 .6 .6 .5 .4 .5 .5 .5 .6 .6 .4 .5 .6 .5 .6 .7 .8 .5 .4 .5 .4 .5 .6 .6 .7 .6 .5 .6 .7 .6 .6 .6 .5 .6 .5 .4
.6 .6 .6 .6 .5 .6 .7 .7 .6 .7 .5 .4 .5 .5 .4 .5 .6 .5 .2 .4 .5 .5 .5 .6 .7 .7 .7 .6 .7 .7 .7 .6 .6 .6 .6 .6
.5 .5 .4 .4 .5 .6 .6 .6 .7 .6 .6 .2 .2 .1 .2 .4 .5 .2 .1 .3 .5 .5 .3 .1 .1 .2 .2 -.1 -.1 .3 .3 .5 .4 .4 .3 .5
.5 .7 .6 .6 .4 .2 .2 .2 .2 .3 .3 .2 .4 .6 .4 .4 -.1 -1.1 -2.1 -2.9 -3.1 -2.9 -2.9 -2.4 -1.8 -2.0 -2.0 -2.6 -3.3 -2.9 -2.8 -1.8 -1.1 -.6 .4 .4
-.4 -.1 .0 .2 .0 -.1 -.4 -.5 -.2 .1 .1 -.1 -.1 -.3 -.4 -.6 -1.0 -1.7 -2.3 -2.7 -3.4 -4.0 -4.4 -4.7 -4.9 -5.0 -5.1 -5.0 -4.6 -3.9 -3.6 -3.3 -2.8 -1.4 -.9 -.6

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : AMSUA–5 channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 35

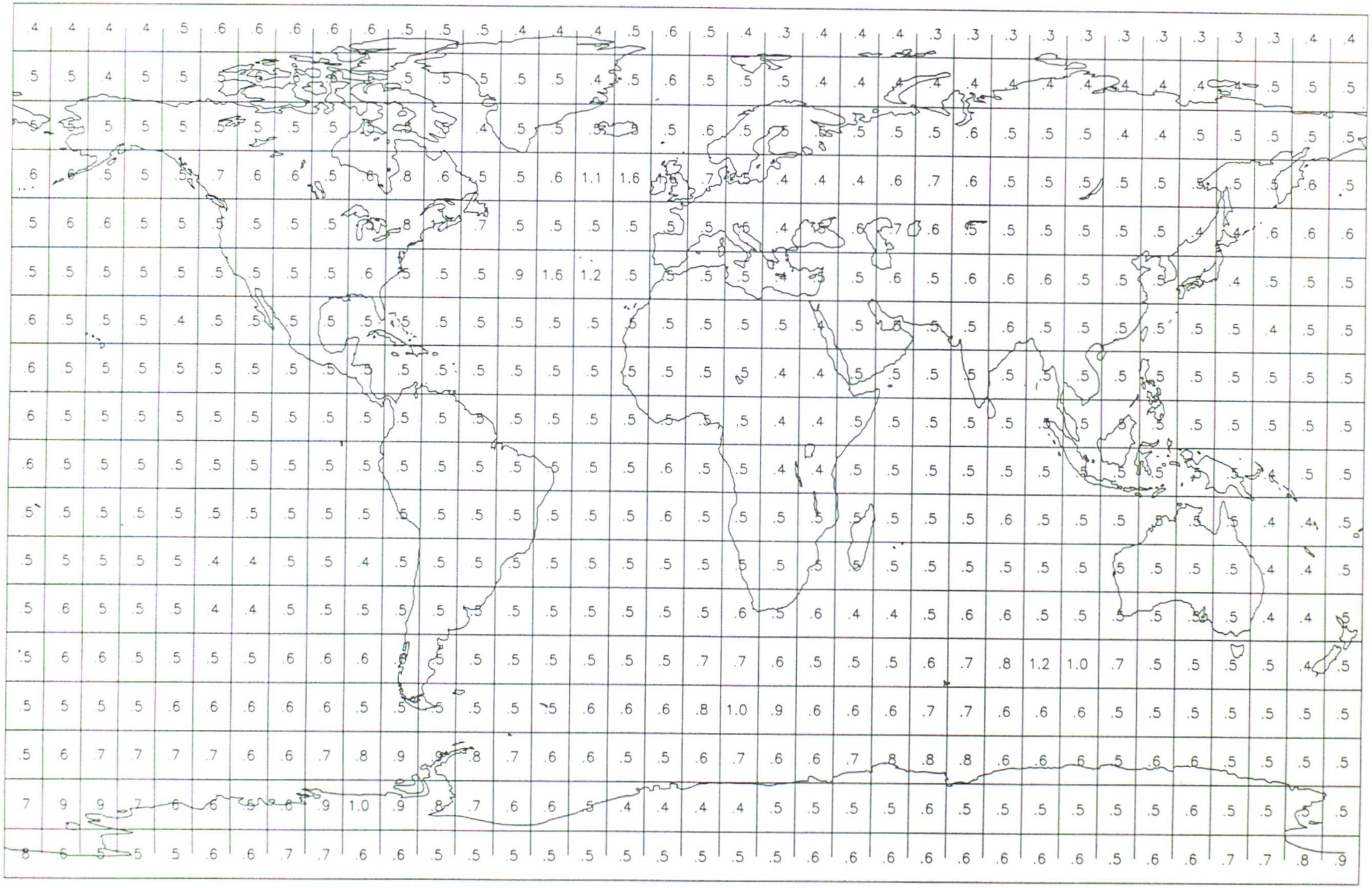

.5 .5 .5 .5 .5 .5 .5 .5 1.0 1.5 1.9 1.1 1.0 1.3 1.3 1.0 .7 .6 .7 1.0 1.3 1.8 .6 .6 .5 .5 .5 .5 .6 .5 .5 .6 .6 .5 .5 .5
.6 .7 .7 .7 .7 [illegible] .6 .6 .4 [illegible] 1.2 .9 1.5 2.6 2.4 1.2 .7 .7 .8 1.2 1.1 1.5 .9 .7 .6 .4 .5 .6 .6 .6 .6 .6 .6 .5 .5 .6
.6 .8 .9 1.2 1.2 .9 .6 .6 .6 .7 .8 .8 .8 2.1 1.5 .9 .8 .6 .8 1.0 .8 .8 .8 .7 .6 .7 .7 .9 .8 .7 .9 1.2 1.2 .9 1.1 .9
.8 .8 .8 .6 .9 1.0 1.2 1.1 .7 .9 1.1 1.0 .6 .7 .6 .6 .7 .8 .7 .6 .5 .5 .7 1.0 1.1 1.0 .9 1.0 1.1 .9 1.4 .7 .7 .8 .8
.8 .7 .7 .7 .7 .8 1.0 1.0 .7 .9 1.1 [illegible] 1.0 .6 .6 .6 .6 .8 .7 .9 .7 .8 .9 .8 .8 1.2 1.2 1.1 .9 .7 .7 .7 .9 .8 .8 .8
.6 .6 .6 .6 .7 .6 1.2 1.3 .7 .6 .7 .7 .6 1.1 1.9 1.4 .6 1.0 .7 .9 .9 .9 1.1 1.7 1.4 2.8 3.3 3.1 1.6 .8 .9 [illegible] .9 1.0 1.0 .8
.8 .6 .5 .4 .4 .4 .8 1.4 .7 .8 1.0 .8 .7 .7 .8 .5 .8 .7 .6 .7 .6 .9 1.1 1.2 1.1 1.1 2.2 1.8 1.0 .6 .8 .6 1.0 1.2 .6 .7
.7 .7 .5 .6 .7 .6 .5 .7 .8 .9 .9 1.1 .9 .5 .6 .5 .8 .8 .5 .5 .7 .8 1.2 .9 .6 .8 .8 .8 .9 1.0 1.2 .9 .8 .8 .7 .8
1.0 1.0 1.0 .8 .9 .8 .6 .5 .8 1.9 .6 .9 .7 .6 .8 .8 .8 .9 .9 .9 .8 .9 .8 .6 .7 .8 .8 1.0 1.0 1.1 1.0 1.0 1.0 .9 1.0 .8
.6 .6 .5 .5 .4 .4 .4 .4 .4 .5 1.2 1.0 .9 .9 .6 .4 .4 .4 .6 1.1 1.0 1.2 .6 .7 .8 .9 .9 1.0 1.1 1.0 1.0 1.1 1.1 1.0 .8 .7
1.1 .6 .7 .8 .7 .5 .4 .4 .5 .5 1.2 1.3 1.1 1.0 .9 .4 .4 .4 .4 1.0 .9 .9 .8 .5 .5 .7 1.1 .9 .4 .5 1.0 1.2 1.1 1.0 .9 1.0
.7 .8 .6 .5 .6 .7 .5 .5 .4 .5 .7 1.2 .8 .8 .6 .5 .5 .5 .5 1.0 1.3 1.0 .6 .4 .7 .8 .7 .7 .5 .9 1.0 1.1 1.0 .7 .5 .7
.6 .7 .7 .6 .6 .6 .7 .6 .6 .6 .7 .9 .7 .5 .6 .6 .6 .6 .5 1.1 1.6 .8 .6 .5 .7 1.0 .8 1.0 .6 .7 .6 .9 .9 .7 .7 .8
.6 .5 .7 .6 .6 .6 .7 .7 .9 1.0 .8 .7 .5 .6 .6 .8 .7 .7 .8 .8 .8 .6 .6 .7 1.0 1.4 1.6 2.6 2.2 1.2 .6 .5 .6 .5 .8 .7
.6 .6 .7 1.0 .9 .7 .7 .6 .7 .8 .7 .7 .6 .6 .7 .8 .7 .8 .9 .9 .8 .7 .7 .7 .9 .9 .9 .7 .5 .6 .6 .7 .6 .7 .7 .6
.6 .6 .8 .9 .9 .8 .7 .7 .7 .7 .7 .9 .8 .7 .6 .6 .6 .6 .9 1.4 1.1 .8 1.2 1.6 2.2 1.7 1.3 1.1 1.1 .9 .9 1.0 .9 .8 .7 .7
1.1 1.4 1.4 1.0 1.1 1.2 1.2 1.0 1.1 1.0 .8 1.0 .7 .7 .8 1.0 1.2 1.6 2.0 2.4 2.6 2.5 2.3 2.2 2.3 2.2 2.3 2.5 2.3 2.1 2.0 1.7 1.5 1.5 1.2 .7
1.6 1.1 .9 .9 .9 1.0 1.2 1.4 1.3 1.0 .8 .8 .9 1.0 1.0 1.3 1.2 1.1 1.1 1.2 1.4 1.5 1.6 1.8 1.9 1.9 1.9 1.9 1.8 1.4 1.2 1.2 1.4 1.8 1.6 1.6

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 36
NOVEMBER 1999 : AMSUA-7 Channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS


.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3
.5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .3 .3 .3 .4 .4 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .2 .2 .3 .4 .4 .5 .6 .6 .5
.8 .8 .8 .8 .7 .6 .5 .5 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .3 .4 .4 .5 .6 .6 .7 .7 .8
.8 .9 .8 .7 .5 .3 .3 .4 .4 .4 .4 .4 .5 .4 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .3 .3 .3 .4 .5 .5 .6 .6 .6 .7 .7 .7
.4 .7 .6 .5 .4 .2 .2 .3 .4 .3 .4 .4 .3 .3 .2 .2 .3 .3 .5 .4 .3 .2 .1 .2 .2 .3 .4 .5 .5 .6 .6 .7 .6 .5 .5 .5
.2 .3 .3 .3 .3 .1 .1 .2 .3 .4 .3 .4 .3 .2 .1 .1 .3 .3 .5 .3 .2 .2 .2 .2 .2 .4 .8 .8 .5 .5 .4 [illegible] .2 .2 .2 .3
.3 .2 .1 .2 .2 .1 .1 .1 .2 .2 .2 .3 .3 .2 .2 .1 .2 .2 .2 .2 .1 .1 .1 .1 .1 .2 .4 .3 .3 .3 .2 .2 .1 .1 .2 .3
.3 .2 .1 .1 .1 .1 .1 .0 .1 .2 .2 .3 .2 .3 .2 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .2 .3 .3 .3 .3 .3 .3 .2 .1 .2 .2
.3 .2 .1 .1 .1 .2 .1 .1 .2 .3 .3 .3 .3 .3 .3 .2 .1 .3 .1 .2 .2 .2 .2 .2 .2 .3 .4 .4 .3 .3 .4 .4 .3 .2 .3 .2
.3 .2 .2 .1 .1 .1 .2 .2 .2 .2 .3 .3 .3 .3 .3 .2 .1 .3 .1 .2 .3 .2 .2 .2 .2 .3 .4 .3 .3 .3 .4 .3 .3 .2 .3 .3
.3 .2 .2 .1 .1 .1 .2 .2 .2 .1 .2 .2 .3 .2 .2 .2 .1 .2 .0 .0 .1 .1 .1 .1 .1 .1 .3 .2 .2 .2 .2 .2 .3 .2 .2 .2
.3 .2 .2 .2 .2 .2 .2 .4 .3 .2 .2 .3 .4 .3 .2 .3 .2 .3 .3 .1 .1 .1 .1 .1 .2 .2 .2 .3 .2 .1 .3 .3 .3 .3 .2 .3
.4 .4 .3 .2 .3 .3 .3 .4 .4 .3 .4 .4 .4 .3 .3 .4 .3 .2 .3 .3 .3 .3 .2 .3 .3 .4 .4 .5 .4 .3 .4 .4 .5 .5 .4 .5
.5 .5 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .3 .3 .4 .3 .2 .3 .2 .3 .4 .4 .4 .5 .5 .5 .7 .5 .5 .5 .5 .5 .5 .4 .6
.6 .6 .5 .5 .5 .5 .6 .6 .5 .5 .4 .4 .4 .3 .3 .5 .5 .3 .3 .3 .3 .4 .4 .5 .5 .6 .6 .7 .7 .6 .5 .6 .5 .6 .6 .6
.7 .7 .7 .6 .6 .6 .6 .5 .5 .5 .4 .4 .3 .3 .3 .4 .4 .3 .2 .2 .3 .3 .3 .3 .3 .3 .4 .5 .6 .7 .6 .6 .5 .6 .6 .6
.4 .5 .5 .5 .6 .5 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .2 .2 .1 .1 .1 .1 .1 .2 .2 .2 .3 .3 .4 .5 .6 .6 .5 .5 .5 .5
.5 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .5 .5 .6 .6 .6 .6 .6 .6 .5

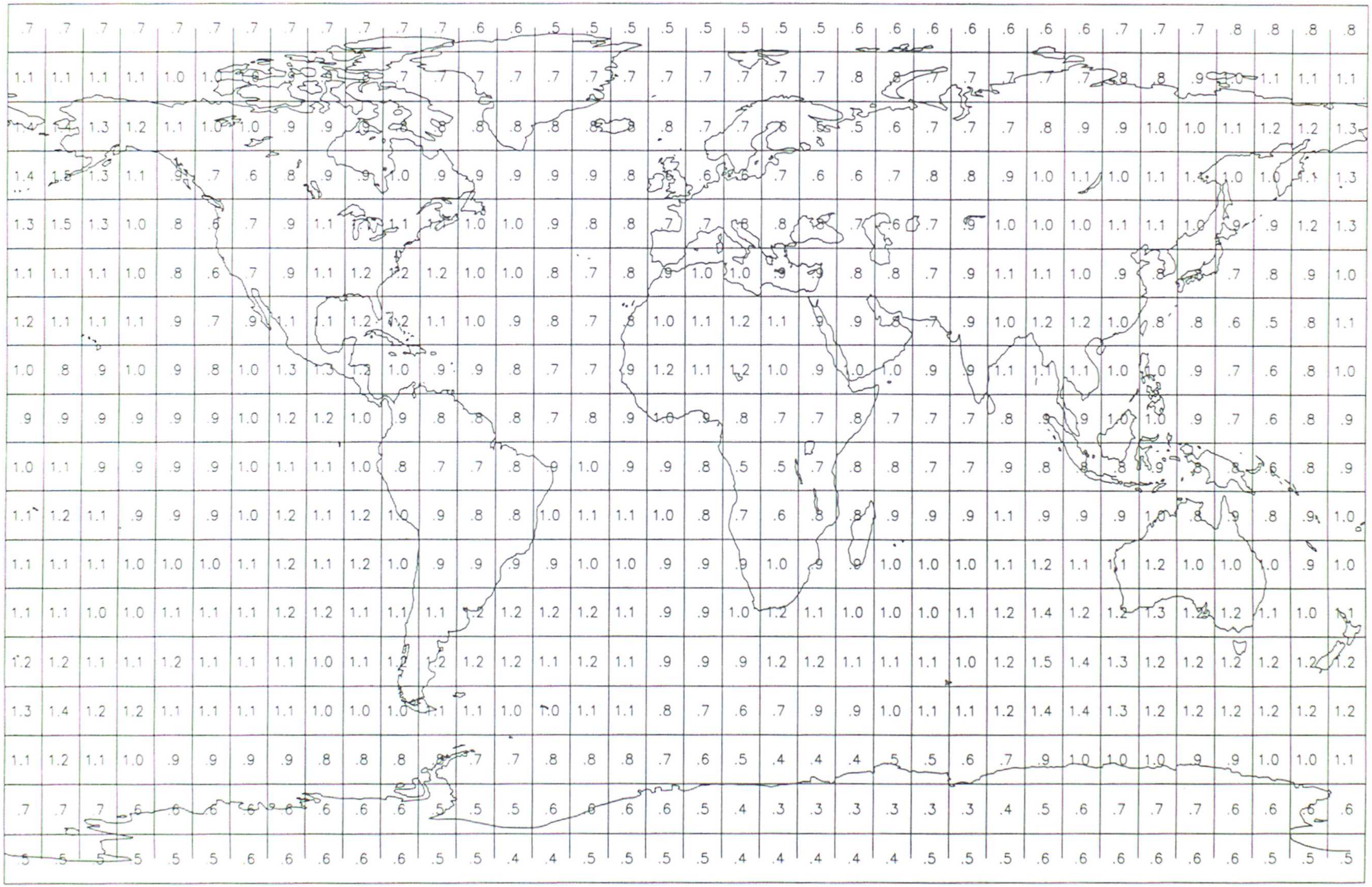
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : AMSUA-7 channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 37



ATOVS : MEAN O−B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
NOVEMBER 1999 : AMSUA−9 Channel (100 hPa)
NOAA−15, USING ALL OBSERVATIONS

FIGURE 38



.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.7	.7	.7	.8	.8	.8	.8
1.1	1.1	1.1	1.1	1.0	[illegible]	.8	[illegible]	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.8	.8	.7	.7	.7	.7	.7	.8	.8	.9	1.0	1.1	1.1	1.1
1.4	1.4	1.3	1.2	1.1	1.0	1.0	.9	.9	.9	.8	.8	.8	.8	.8	.8	.8	.8	.7	.7	.6	.5	.5	.6	.7	.7	.7	.8	.9	.9	1.0	1.0	1.1	1.2	1.2	1.3
1.4	1.5	1.3	1.1	.9	.7	.6	.8	.9	.9	1.0	.9	.9	.9	.9	.9	.8	.6	.6	.6	.7	.6	.6	.7	.8	.8	.9	1.0	1.1	1.0	1.1	1.4	1.0	1.0	1.1	1.3
1.3	1.5	1.3	1.0	.8	.6	.7	.9	1.1	[illegible]	1.1	[illegible]	1.0	1.0	.9	.8	.8	.7	.7	.8	.8	.8	.7	.6	.7	.9	1.0	1.0	1.0	1.1	1.1	1.0	.9	.9	1.2	1.3
1.1	1.1	1.1	1.0	.8	.6	.7	.9	1.1	1.2	1.2	1.2	1.0	1.0	.8	.7	.8	.9	1.0	1.0	.9	.9	.8	.8	.7	.9	1.1	1.1	1.0	.9	.8		.7	.8	.9	1.0
1.2	1.1	1.1	1.1	.9	.7	.9	1.1	1.1	1.2	1.2	1.1	1.0	.9	.8	.7	.8	1.0	1.1	1.2	1.1	.9	.9	.8	.7	.9	1.0	1.2	1.2	1.0	.8	.8	.6	.5	.8	1.1
1.0	.8	.9	1.0	.9	.8	1.0	1.3	1.3	1.2	1.0	.9	.9	.8	.7	.7	.9	1.2	1.1	1.2	1.0	.9	1.0	1.0	.9	.9	1.1	1.1	1.1	1.0	1.0	.9	.7	.6	.8	1.0
.9	.9	.9	.9	.9	.9	1.0	1.2	1.2	1.0	.9	.8	.8	.8	.7	.8	.9	1.0	.9	.8	.7	.7	.8	.7	.7	.7	.8	.9	.9	1.0	1.0	.9	.7	.6	.8	.9
1.0	1.1	.9	.9	.9	.9	1.0	1.1	1.1	1.0	.8	.7	.7	.8	.9	1.0	.9	.9	.8	.5	.5	.7	.8	.8	.7	.7	.9	.8	.8	.8	.9	.8	.8	.6	.8	.9
1.1	1.2	1.1	.9	.9	.9	1.0	1.2	1.1	1.2	1.0	.9	.8	.8	1.0	1.1	1.1	1.0	.8	.7	.6	.8	.8	.9	.9	.9	1.1	.9	.9	.9	1.0	.8	.9	.8	.9	1.0
1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.2	1.1	1.2	1.0	.9	.9	.9	.9	1.0	1.0	.9	.9	.9	1.0	.9	.9	1.0	1.0	1.0	1.1	1.2	1.1	1.1	1.2	1.0	1.0	1.0	.9	1.0
1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.1	.9	.9	1.0	1.2	1.1	1.0	1.0	1.0	1.1	1.2	1.4	1.2	1.2	1.3	1.2	1.2	1.1	1.0	1.1
1.2	1.2	1.1	1.1	1.2	1.1	1.1	1.1	1.0	1.1	1.2	1.2	1.2	1.2	1.1	1.2	1.1	.9	.9	.9	1.2	1.2	1.1	1.1	1.1	1.0	1.2	1.5	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2
1.3	1.4	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.1	.8	.7	.6	.7	.9	.9	1.0	1.1	1.1	1.2	1.4	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2
1.1	1.2	1.1	1.0	.9	.9	.9	.9	.8	.8	.8	.8	.7	.7	.8	.8	.8	.7	.6	.5	.4	.4	.4	.5	.5	.6	.7	.9	1.0	1.0	1.0	.9	.9	1.0	1.0	1.1
.7	.7	.7	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.6	.6	.6	.6	.5	.4	.3	.3	.3	.3	.3	.3	.4	.5	.6	.7	.7	.7	.6	.6	.6	.6
.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.5	.5	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.5	.5	.6	.6	.6	.6	.6	.6	.5	.5	.5

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
NOVEMBER 1999 : AMSUA-9 channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 39

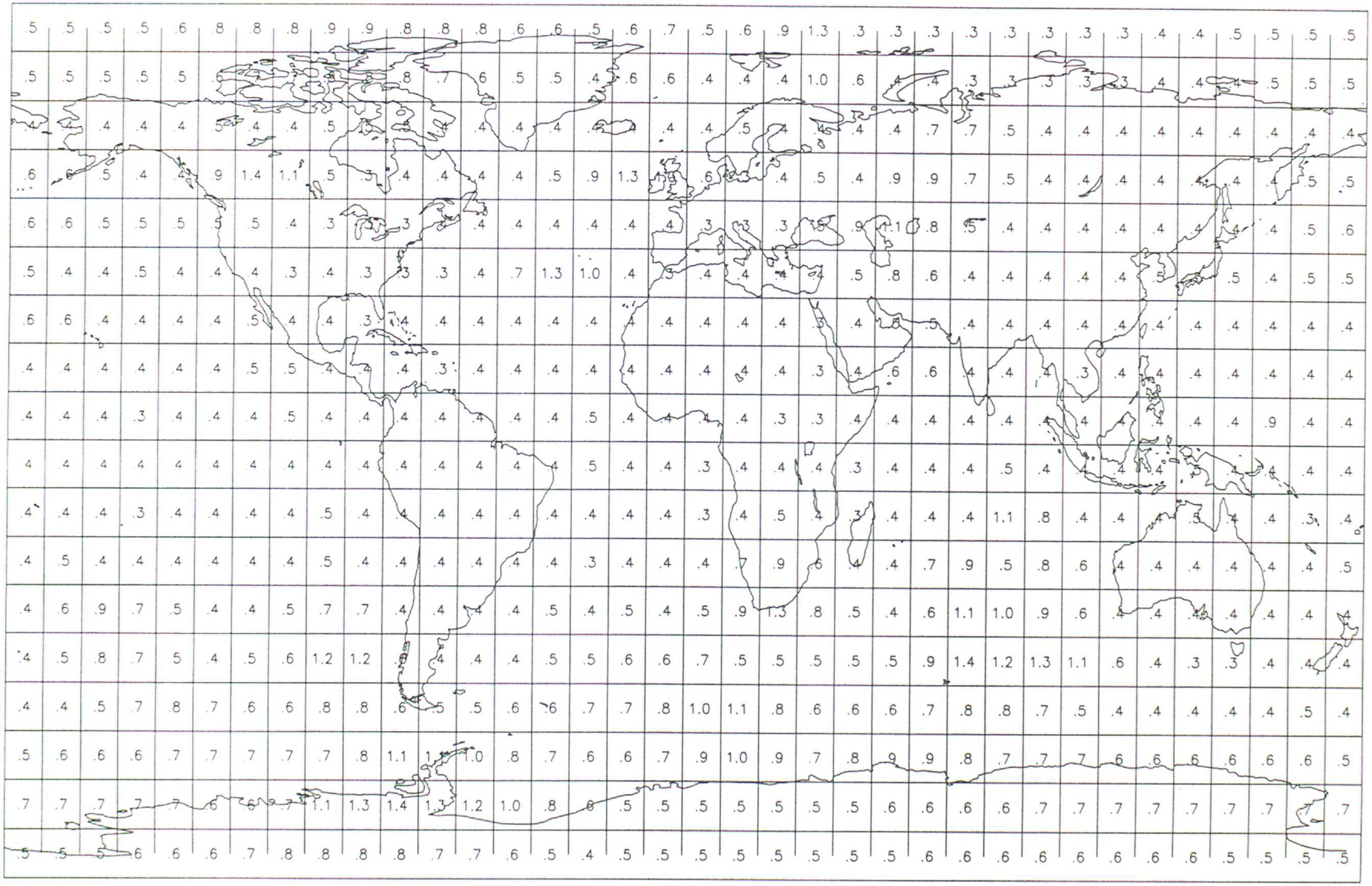

.5 .5 .5 .5 .6 .8 .8 .8 .9 .9 .8 .8 .8 .6 .6 .5 .6 .7 .5 .6 .9 1.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .5 .5 .5 .5
.5 .5 .5 .5 .5 .6 .7 [illegible] .8 [illegible] .8 .7 .6 .5 .5 .4 .6 .6 .4 .4 .4 1.0 .6 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .5 .5 .5
.4 .4 .4 .4 .4 .5 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .7 .7 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4
.6 .6 .5 .4 .4 .9 1.4 1.1 .5 .3 .4 .4 .4 .4 .5 .9 1.3 [illegible] .6 [illegible] .4 .5 .4 .9 .9 .7 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5
.6 .6 .5 .5 .5 .5 .5 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .5 .9 1.1 .8 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .6
.5 .4 .4 .5 .4 .4 .4 .3 .4 .3 .3 .3 .4 .7 1.3 1.0 .4 .3 .4 .4 .4 .4 .5 .8 .6 .4 .4 .4 .4 .4 .5 [illegible] .5 .4 .5 .5
.6 .6 .4 .4 .4 .4 .5 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .8 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .6 .6 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .3 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .9 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .3 .4 .4 .4 .3 .4 .4 .4 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4
.4 .4 .4 .3 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .5 .4 .3 .4 .4 .4 1.1 .8 .4 .4 .4 .5 .4 .4 .3 .4
.4 .5 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .7 .9 .6 .4 .4 .7 .9 .5 .8 .6 .4 .4 .4 .4 .4 .4 .5
.4 .6 .9 .7 .5 .4 .4 .5 .7 .7 .4 .4 .4 .4 .5 .4 .5 .4 .5 .9 1.3 .8 .5 .4 .6 1.1 1.0 .9 .6 .4 .4 .4 .4 .4 .4 .4
.4 .5 .8 .7 .5 .4 .5 .6 1.2 1.2 .8 .4 .4 .4 .5 .5 .6 .6 .7 .5 .5 .5 .5 .5 .9 1.4 1.2 1.3 1.1 .6 .4 .3 .3 .4 .4 .4
.4 .4 .5 .7 .8 .7 .6 .6 .8 .8 .6 .5 .5 .6 .6 .7 .7 .8 1.0 1.1 .8 .6 .6 .6 .7 .8 .8 .7 .5 .4 .4 .4 .4 .4 .5 .4
.5 .6 .6 .6 .7 .7 .7 .7 .7 .8 1.1 [illegible] 1.0 .8 .7 .6 .6 .7 .9 1.0 .9 .7 .8 .9 .9 .8 .7 .7 .7 .6 .6 .6 .6 .6 .6 .5
.7 .7 .7 .7 .7 .6 .6 .7 1.1 1.3 1.4 1.3 1.2 1.0 .8 .8 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7
.5 .5 .5 .6 .6 .6 .7 .8 .8 .8 .8 .7 .7 .6 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13504	24.8	-17.7	ALL	P	SUR	150	0	0	0.8	0.0	0.8
41505	37.0	-57.7	ALL	P	SUR	299	0	0	1.0	0.0	1.0
41520	21.4	-54.1	ALL	P	SUR	265	0	0	0.8	-0.3	0.8
41521	26.4	-67.8	ALL	P	SUR	277	0	0	0.8	0.1	0.8
41524	17.8	-71.0	ALL	P	SUR	190	0	0	0.9	0.3	1.0
41525	14.1	-55.1	ALL	P	SUR	78	0	0	0.6	0.2	0.6
41528	35.4	-62.1	ALL	P	SUR	304	0	0	0.9	-0.1	0.9
41599	28.2	-38.0	ALL	P	SUR	661	16	2	1.0	-0.1	1.0
41625	28.5	-71.6	ALL	P	SUR	258	0	0	0.8	0.1	0.8
41630	21.0	-45.1	ALL	P	SUR	269	0	0	0.8	0.1	0.8
41637	28.0	-47.3	ALL	P	SUR	130	0	0	0.8	0.5	1.0
41638	24.9	-35.2	ALL	P	SUR	45	0	0	1.1	0.1	1.1
41641	15.7	-55.6	ALL	P	SUR	212	0	0	0.8	0.5	1.0
41644	23.9	-48.1	ALL	P	SUR	264	0	0	0.8	-0.2	0.8
41649	28.0	-69.4	ALL	P	SUR	39	0	0	1.0	-0.1	1.0
41650	26.8	-75.4	ALL	P	SUR	10	0	0	0.6	-0.1	0.6
41651	25.3	-74.4	ALL	P	SUR	271	0	0	0.9	0.7	1.1
41652	23.1	-71.9	ALL	P	SUR	211	0	0	1.1	-0.8	1.4
41653	19.8	-70.7	ALL	P	SUR	98	0	0	0.8	-4.2	4.2
41654	17.8	-63.6	ALL	P	SUR	209	2	1	2.8	-2.2	3.6
41671	27.0	-70.5	ALL	P	SUR	169	0	0	0.8	0.5	1.0
41852	35.4	-55.0	ALL	P	SUR	80	61	76	2.4	-10.1	10.4
41853	31.4	-73.8	ALL	P	SUR	333	0	0	0.9	1.1	1.4
44511	41.1	-66.5	ALL	P	SUR	1	0	0	0.0	-0.6	0.6
44513	48.7	-48.5	ALL	P	SUR	341	0	0	1.6	0.8	1.8
44514	51.5	-43.9	ALL	P	SUR	265	16	6	3.6	2.2	4.2
44515	49.9	-40.0	ALL	P	SUR	9	3	33	2.1	0.8	2.2
44546	41.1	-32.0	ALL	P	SUR	1665	0	0	1.0	0.3	1.0
44607	52.7	-38.9	ALL	P	SUR	626	1	0	2.0	0.0	2.0
44608	40.7	-17.2	ALL	P	SUR	1574	0	0	0.9	-0.1	0.9
44610	55.8	-35.7	ALL	P	SUR	1657	2	0	1.8	0.1	1.8
44613	27.7	-25.5	ALL	P	SUR	941	10	1	1.5	-0.3	1.5
44614	49.0	-26.3	ALL	P	SUR	980	6	1	1.5	-0.5	1.6
44616	60.4	-11.3	ALL	P	SUR	1437	2	0	1.9	-0.1	1.9
44621	49.9	-18.5	ALL	P	SUR	1068	15	1	1.2	-0.3	1.2
44624	60.1	-8.3	ALL	P	SUR	1939	5	0	1.8	-0.3	1.8
44625	50.1	-18.6	ALL	P	SUR	1729	11	1	1.2	0.1	1.2
44626	48.6	-41.3	ALL	P	SUR	1363	8	1	1.5	-0.5	1.5
44627	41.9	-43.9	ALL	P	SUR	1183	8	1	1.2	-0.1	1.2
44628	39.6	-40.9	ALL	P	SUR	1099	4	0	1.1	0.1	1.2
44630	43.9	-31.5	ALL	P	SUR	1216	5	0	1.0	-0.2	1.0
44721	56.5	-36.5	ALL	P	SUR	1463	11	1	1.6	-0.6	1.8
44722	52.1	-42.5	ALL	P	SUR	1300	7	1	1.7	-0.8	1.9
44723	50.4	-39.2	ALL	P	SUR	91	1	1	2.3	0.0	2.3
44742	43.5	-6.4	ALL	P	SUR	29	0	0	1.2	0.5	1.3
44765	31.1	-52.7	ALL	P	SUR	507	10	2	1.4	0.0	1.4
44766	53.8	-23.6	ALL	P	SUR	1309	12	1	1.9	-0.7	2.0
44773	63.8	-23.6	ALL	P	SUR	2106	11	1	1.5	-0.5	1.6
44777	57.0	-48.2	ALL	P	SUR	1730	19	1	2.1	-0.4	2.1
44778	51.4	-5.3	ALL	P	SUR	163	2	1	1.6	-9.1	9.2
45803	45.4	-82.8	ALL	P	SUR	1	0	0	0.0	-0.8	0.8
46729	44.7	-63.6	ALL	P	SUR	16	0	0	1.9	-6.0	6.3
47553	72.5	-68.1	ALL	P	SUR	1020	0	0	1.1	-0.6	1.3
52542	47.1	-60.4	ALL	P	SUR	98	98	100			
62506	38.2	-19.1	ALL	P	SUR	639	0	0	2.8	-1.9	3.4
62507	42.1	-20.5	ALL	P	SUR	1049	9	1	1.1	-0.1	1.1
62508	45.3	-15.9	ALL	P	SUR	1034	8	1	1.6	-0.9	1.8
62509	48.2	-13.1	ALL	P	SUR	1276	2	0	1.2	0.0	1.2
62510	48.4	-12.0	ALL	P	SUR	589	0	0	1.3	0.0	1.3
62520	29.7	-27.3	ALL	P	SUR	926	1	0	0.8	-0.4	0.9

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62529	48.7	-12.4	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
62554	34.5	-13.3	ALL	P	SUR	566	67	12	1.0	0.4	1.1
62596	53.8	-28.1	ALL	P	SUR	97	0	0	1.8	0.6	1.9
62703	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	0.8	0.8
62706	56.9	-9.5	ALL	P	SUR	1	0	0	0.0	-1.5	1.5
62707	50.1	-6.1	ALL	P	SUR	2	0	0	0.3	0.3	0.5
62708	53.5	-19.5	ALL	P	SUR	1	0	0	0.0	-1.9	1.9
64516	63.4	-51.3	ALL	P	SUR	1305	1	0	1.9	-0.6	2.0
64517	55.7	-54.1	ALL	P	SUR	1216	0	0	2.0	-0.7	2.2
64518	56.8	-35.1	ALL	P	SUR	1253	0	0	1.7	-1.1	2.1
64530	62.8	-28.0	ALL	P	SUR	1311	15	1	1.7	-0.7	1.9
64546	62.3	-22.7	ALL	P	SUR	1785	3	0	1.6	-0.7	1.8
64693	66.4	-22.3	ALL	P	SUR	11	0	0	2.4	3.0	3.8
64694	66.4	-15.4	ALL	P	SUR	134	1	1	2.4	-0.7	2.5
64698	60.0	-44.6	ALL	P	SUR	864	0	0	2.0	-0.5	2.1
64699	60.6	-50.8	ALL	P	SUR	888	4	0	2.1	-0.7	2.2
64846	60.5	-5.0	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
65593	64.1	-21.8	ALL	P	SUR	318	4	1	2.1	-5.6	6.0
65594	62.0	-36.0	ALL	P	SUR	1280	12	1	1.9	-0.8	2.1
65595	61.0	-21.7	ALL	P	SUR	1664	84	5	1.9	-0.9	2.1
65596	62.4	-26.2	ALL	P	SUR	1178	0	0	1.6	-0.7	1.7
65599	62.3	-36.0	ALL	P	SUR	2061	9	0	2.1	-0.3	2.1
WIND SPEED											
41520	21.4	-54.1	ALL	SPEED	SUR	4	0	0	0.7	1.6	1.7
41521	26.4	-67.8	ALL	SPEED	SUR	272	0	0	1.3	-1.2	1.8
41524	17.8	-71.0	ALL	SPEED	SUR	51	0	0	4.1	5.2	6.6
41625	28.5	-71.6	ALL	SPEED	SUR	244	0	0	1.4	-2.6	2.9
41630	21.0	-45.1	ALL	SPEED	SUR	260	0	0	2.1	-0.1	2.1
41641	15.7	-55.6	ALL	SPEED	SUR	202	0	0	2.6	0.5	2.7
41644	23.9	-48.1	ALL	SPEED	SUR	4	0	0	2.1	-6.3	6.7
41649	28.0	-69.4	ALL	SPEED	SUR	36	0	0	5.4	2.0	5.8
41651	25.3	-74.4	ALL	SPEED	SUR	14	0	0	4.1	5.1	6.5
41652	23.1	-71.9	ALL	SPEED	SUR	199	0	0	4.8	2.8	5.6
44511	41.1	-66.5	ALL	SPEED	SUR	1	0	0	0.0	-0.3	0.3
44607	52.7	-38.9	ALL	SPEED	SUR	619	0	0	2.5	0.9	2.7
44721	56.5	-36.5	ALL	SPEED	SUR	1218	0	0	2.3	-1.4	2.7
44773	63.8	-23.6	ALL	SPEED	SUR	1378	0	0	3.0	-0.8	3.1
44777	57.0	-48.2	ALL	SPEED	SUR	1256	0	0	2.7	-0.6	2.7
62506	38.2	-19.1	ALL	SPEED	SUR	626	0	0	2.1	0.4	2.1
62508	45.3	-15.9	ALL	SPEED	SUR	903	0	0	1.6	0.1	1.6
62510	48.4	-12.0	ALL	SPEED	SUR	567	0	0	2.1	1.0	2.3
62529	48.7	-12.4	ALL	SPEED	SUR	1	0	0	0.0	-1.3	1.3
62707	50.1	-6.1	ALL	SPEED	SUR	2	0	0	3.4	0.1	3.4
62708	53.5	-19.5	ALL	SPEED	SUR	1	0	0	0.0	0.9	0.9
64846	60.5	-5.0	ALL	SPEED	SUR	1	0	0	0.0	-2.8	2.8
65599	62.3	-36.0	ALL	SPEED	SUR	1089	0	0	4.5	-1.7	4.8
WIND DIRECTION											
41521	26.4	-67.8	ALL	DIRN.	SUR	241	0	0	12.5	-12.0	17.3
41524	17.8	-71.0	ALL	DIRN.	SUR	28	0	0	15.6	-6.8	17.0
41625	28.5	-71.6	ALL	DIRN.	SUR	173	0	0	12.3	11.9	17.1
41630	21.0	-45.1	ALL	DIRN.	SUR	111	0	0	19.4	18.7	27.0
41641	15.7	-55.6	ALL	DIRN.	SUR	132	0	0	21.3	23.1	31.4
41649	28.0	-69.4	ALL	DIRN.	SUR	30	0	0	28.2	5.4	28.7
41651	25.3	-74.4	ALL	DIRN.	SUR	10	0	0	26.0	-30.0	39.7
41652	23.1	-71.9	ALL	DIRN.	SUR	160	0	0	19.9	3.1	20.1
44607	52.7	-38.9	ALL	DIRN.	SUR	583	0	0	18.3	-3.5	18.7
44721	56.5	-36.5	ALL	DIRN.	SUR	1113	0	0	14.6	4.3	15.2

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
44773	63.8	-23.6	ALL	DIRN.	SUR	1167	0	0	19.8	-3.1	20.0
44777	57.0	-48.2	ALL	DIRN.	SUR	1017	0	0	19.7	-0.5	19.7
62506	38.2	-19.1	ALL	DIRN.	SUR	516	0	0	17.7	-9.8	20.3
62508	45.3	-15.9	ALL	DIRN.	SUR	746	0	0	15.8	-2.6	16.1
62510	48.4	-12.0	ALL	DIRN.	SUR	500	0	0	19.0	-3.0	19.2
62529	48.7	-12.4	ALL	DIRN.	SUR	1	0	0	0.0	-6.5	6.5
62707	50.1	-6.1	ALL	DIRN.	SUR	2	0	0	21.7	10.8	24.2
62708	53.5	-19.5	ALL	DIRN.	SUR	1	0	0	0.0	-7.8	7.8
64846	60.5	-5.0	ALL	DIRN.	SUR	1	0	0	0.0	-2.9	2.9
65599	62.3	-36.0	ALL	DIRN.	SUR	647	0	0	30.3	0.2	30.3

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures:		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in $m\ s^{-1}$
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 $m\ s^{-1}$ Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3499	0	4	1.6	0.1	3472	0	6	0	9.2	0.4
ACA	1431	0	2	1.7	-0.2	1465	0	3	0	7.7	0.8
AEA	184	1	7	2.2	0.4	178	1	6	0	8.1	1.5
AEL	303	2	24	3.2	1.0	300	0	15	0	9.1	0.4
AFL	304	1	4	1.5	0.3	303	1	4	0	7.5	0.3
AFR	1265	0	7	1.7	0.1	1288	0	8	0	8.2	0.9
AIH	379	0	3	1.4	-0.2	383	1	4	0	7.6	0.3
AJM	78	0	0	1.0	-0.5	78	0	1	0	6.4	0.2
AMM	80	0	8	1.7	0.4	80	0	9	0	7.6	-0.2
AMX	229	3	7	2.0	0.3	226	0	6	0	9.8	0.1
ANZ	186	0	10	1.7	-1.0	191	1	12	0	7.6	0.2
AOM	377	1	3	1.7	0.4	385	0	3	0	8.0	1.0
AUA	33	3	6	1.8	0.2	32	0	0	0	8.0	0.8
AVA	186	1	2	1.9	0.5	188	0	4	0	10.4	0.4
AZA	465	3	14	2.3	0.6	460	0	8	0	9.4	1.0
BAF	25	4	8	1.7	-1.0	25	0	4	0	6.4	2.6
BAL	192	1	11	1.6	-0.1	198	0	12	0	7.2	0.9
BAW	1448	1	8	1.7	-0.1	1470	0	10	0	8.9	0.8
BBB	20	0	0	1.1	-0.3	21	0	0	0	7.6	2.6
BLX	25	0	4	2.3	0.2	24	0	4	0	7.6	0.8
BWA	70	3	11	2.3	1.6	71	0	17	0	13.6	1.6
CDN	531	0	4	1.8	0.0	537	0	4	0	9.1	0.6
CFC	37	0	5	2.4	1.1	37	0	5	0	6.9	0.7
CFG	637	1	4	1.7	-0.8	645	0	4	0	7.9	0.3
CKS	49	0	2	2.0	-0.8	46	0	4	0	7.4	0.1
CKT	71	1	3	1.7	0.8	70	0	4	0	9.5	2.2
CLX	269	1	2	1.8	-0.3	272	0	1	0	7.1	0.9
CMM	104	1	4	1.7	-0.3	101	0	5	0	7.7	0.5
COA	781	0	3	1.6	0.1	785	0	10	0	13.5	2.1
CRL	170	1	4	1.5	0.6	169	0	2	0	6.8	0.8
CTB	88	1	1	1.3	0.1	92	0	1	0	8.0	0.7
CUB	199	1	4	1.8	1.1	200	0	5	0	8.7	0.8
DAL	1773	0	12	1.7	-0.5	1773	0	13	0	9.2	0.8
DBY	313	0	3	1.5	-0.4	316	0	4	0	8.6	0.6
DLH	2073	0	5	1.6	-0.1	2074	0	6	0	8.4	0.9
EEZ	60	2	8	2.1	1.5	63	2	11	0	9.6	0.0
ELY	137	1	2	1.5	0.3	138	1	5	0	7.6	1.2
EWW	65	3	8	1.6	0.3	65	0	5	0	7.8	1.5
FDX	458	2	7	1.7	0.3	473	0	7	0	9.4	1.0
FIN	409	0	5	1.8	0.4	404	0	5	0	7.9	0.2
GAF	81	0	2	1.6	0.0	83	0	2	0	8.9	-0.6
GRL	50	0	2	1.8	-0.2	49	0	2	0	9.3	-0.1
GTI	114	1	11	2.1	-0.4	113	1	12	0	9.3	-0.3
HLF	52	0	2	1.5	-0.6	52	2	6	0	8.1	1.3
IBE	1152	1	10	1.8	0.3	1142	0	11	0	9.0	0.8
ICE	1220	1	3	1.5	0.0	1219	0	4	0	7.9	0.9
IWD	34	0	9	1.6	-0.1	34	0	9	0	10.7	-0.3
JKK	171	2	5	1.6	0.1	161	1	6	0	8.2	0.7
KLM	1960	0	9	1.9	0.4	1982	0	9	0	8.4	0.6
LDA	133	0	9	1.4	0.1	130	0	11	0	6.9	0.8
LDI	274	0	100	1.8	-0.6	277	0	11	0	8.2	0.0
LIB	99	2	4	1.9	1.3	100	0	6	0	10.2	1.2
LOT	190	1	7	2.0	-0.8	182	1	7	0	10.3	0.1
LTU	343	1	5	1.7	-0.1	343	0	6	0	9.0	0.6
MAH	20	0	0	1.2	-0.4	20	0	0	0	7.5	-0.3
MAS	65	2	8	1.5	0.2	66	2	9	0	9.3	1.0
MON	56	0	7	2.2	-0.6	54	0	4	0	5.9	0.9
MPD	88	1	2	1.5	0.6	84	1	4	0	8.7	1.5
MPH	516	0	2	1.7	-0.5	516	1	3	0	8.6	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
NCA	37	0	0	1.3	0.4	36	0	0	0	6.6	0.3
NVR	76	0	0	1.3	0.3	79	0	4	0	9.2	1.0
NWA	2662	1	2	1.7	0.5	2580	0	3	0	8.8	0.8
PAC	89	1	100	2.7	0.6	93	0	10	0	12.3	0.2
RAM	55	2	4	1.8	-0.8	57	0	2	0	8.8	-0.3
RCH	71	1	4	2.1	0.9	75	0	7	0	13.7	0.7
RJA	45	0	0	1.4	-0.1	44	0	2	0	10.7	1.2
RRR	89	1	6	1.6	0.1	89	0	6	0	7.7	0.7
SAB	48	0	0	1.1	0.3	50	0	4	0	7.9	-0.1
SAS	1458	0	26	1.6	-0.2	1449	0	26	0	8.0	0.4
SIA	124	0	4	1.8	-0.6	128	1	5	0	6.3	0.6
SLR	85	0	13	1.8	-0.9	87	0	15	0	7.7	1.0
SNB	98	49	63	5.3	3.4	98	0	8	0	11.3	-0.4
SVA	88	3	7	1.3	0.0	90	1	7	0	8.9	1.5
SWR	100	0	5	1.6	0.1	102	2	9	0	9.3	1.8
TAP	249	1	5	1.6	-0.1	245	1	7	0	9.2	1.9
TOW	190	1	8	2.1	0.6	190	0	8	0	8.4	1.3
TWA	1198	1	3	1.8	0.1	1133	0	5	0	9.2	1.1
UAL	1879	0	6	1.7	-0.2	1905	0	7	0	7.8	0.9
UPS	558	2	16	2.1	0.6	555	0	15	0	8.4	0.3
USA	193	1	3	1.6	-0.2	161	0	3	0	8.6	1.2
VIR	652	1	2	1.8	-0.2	657	0	4	0	8.7	1.1
VKG	46	0	4	1.7	0.6	46	0	7	0	7.3	1.0
WOA	161	1	8	1.4	0.3	161	1	8	0	8.3	0.9
BA	2668	0	9	1.5	0.4	2661	0	9	0	6.6	1.0
EU	17265	0	26	1.3	0.0	17265	0	26	0	6.4	0.7
KL	3657	0	7	1.5	0.7	3654	0	7	0	6.7	0.9
LH	664	0	11	1.8	0.9	664	0	10	0	6.2	0.9
N	345	0	3	2.0	0.4	351	0	5	0	8.8	1.1
US ACARS	13444	0	23	1.5	0.5	13440	0	19	0	7.0	0.8

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	6	0	12.8	27.1	23.8
DBBH	12	Z	100	11	0	12.5	21.3	17.3
EL/L7	00	Z	100	1	0	0.0	28.0	28.0
ELML7	00	Z	100	17	0	13.1	30.1	27.1
ELML7	12	Z	100	18	0	62.9	67.1	23.5
FNOR	00	Z	100	13	0	15.1	30.3	26.2
FNOR	12	Z	100	11	0	17.5	37.5	33.2
FNOU	00	Z	100	12	0	11.9	30.7	28.3
FNOU	12	Z	100	10	0	10.1	30.3	28.6
FNPH	00	Z	100	11	0	10.1	25.0	22.8
FNPH	12	Z	100	8	0	4.6	20.9	20.4
FNRS	00	Z	100	11	0	16.5	26.7	21.0
FNRS	12	Z	100	10	0	13.4	29.5	26.3
JBOA	00	Z	100	1	0	0.0	46.0	46.0
JCCX	00	Z	100	1	0	0.0	42.0	42.0
JNSR	00	Z	100	1	0	0.0	10.0	10.0
LDWR	00	Z	100	22	0	10.8	15.2	-10.7
LDWR	12	Z	100	22	0	12.5	14.8	-7.9
OVYA2	00	Z	100	13	0	37.2	37.2	-0.1
OVYA2	12	Z	100	14	1	18.7	18.9	2.8
OXYH2	00	Z	100	19	0	17.2	17.5	2.8
OXYH2	12	Z	100	16	0	18.1	18.6	4.4
S6LA	00	Z	100	6	0	15.3	18.4	10.2
S6LA	12	Z	100	8	0	12.3	18.5	13.9
UCKZ	00	Z	100	7	0	6.9	45.1	44.6
03953	00	Z	100	27	0	11.6	25.8	23.0
03953	12	Z	100	29	0	15.1	21.5	15.3
04018	00	Z	100	29	0	13.9	15.9	7.6
04018	12	Z	100	30	0	17.5	17.8	3.1
04220	00	Z	100	27	1	17.1	18.2	-6.3
04220	12	Z	100	28	0	13.3	15.6	-8.3
04270	00	Z	100	27	0	24.3	26.5	-10.7
04270	12	Z	100	28	0	18.0	22.7	-13.8
04339	00	Z	100	26	0	17.4	20.6	11.1
04339	12	Z	100	28	0	12.5	12.5	-1.2
04360	00	Z	100	27	0	15.1	15.8	4.5
04360	12	Z	100	26	0	13.0	13.9	-4.9
08001	00	Z	100	29	0	23.0	24.5	-8.6
08001	12	Z	100	28	0	22.4	24.3	-9.3
08508	00	Z	100	23	0	13.0	26.6	23.2
08508	12	Z	100	25	0	15.8	38.5	35.1
08522	00	Z	100	1	0	0.0	3.0	3.0
08522	12	Z	100	28	0	12.6	18.6	13.8
08594	12	Z	100	17	0	21.6	27.9	17.7
60020	00	Z	100	4	0	12.1	22.5	19.0
60020	12	Z	100	4	0	15.6	18.0	9.0
71600	00	Z	100	30	0	12.1	12.2	1.6
71600	12	Z	100	30	0	21.9	23.3	-8.0
72201	00	Z	100	29	0	16.2	26.0	20.3
72201	12	Z	100	30	0	12.4	35.7	33.4
72402	00	Z	100	28	0	25.6	29.2	14.2
72402	12	Z	100	26	1	17.7	38.2	33.9
74494	00	Z	100	21	0	13.3	13.6	2.6
74494	12	Z	100	29	0	13.6	14.5	-4.9
78016	00	Z	100	28	0	11.1	43.3	41.9
78016	12	Z	100	27	0	14.3	44.3	42.0

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	8	0	8.9	11.8	7.9
DBBH	12	Z	500	11	0	4.1	9.1	8.1
DBBH/2400		Z	500	1	0	0.0	6.0	-6.0
EL/L7	00	Z	500	1	0	0.0	3.0	3.0
ELML7	00	Z	500	19	0	8.7	12.1	8.3
ELML7	12	Z	500	20	0	10.6	13.1	7.8
F/QH	00	Z	500	1	0	0.0	4.0	-4.0
FNOR	00	Z	500	14	0	14.7	15.3	4.2
FNOR	12	Z	500	12	0	11.1	13.3	7.3
FNOU	00	Z	500	12	0	9.2	10.1	4.1
FNOU	12	Z	500	10	0	8.1	12.9	10.1
FNPH	00	Z	500	12	0	10.0	13.4	9.0
FNPH	12	Z	500	10	0	5.7	8.2	5.8
FNRS	00	Z	500	11	1	13.0	13.8	4.5
FNRS	12	Z	500	11	0	7.8	11.9	9.0
JBOA	00	Z	500	1	0	0.0	16.0	16.0
JCCX	00	Z	500	1	0	0.0	10.0	10.0
JNSR	00	Z	500	1	0	0.0	9.0	9.0
LDWR	00	Z	500	24	0	10.1	10.1	0.1
LDWR	12	Z	500	23	0	13.0	14.2	-5.7
OVYA2	00	Z	500	16	0	32.2	32.8	-5.9
OVYA2	12	Z	500	17	0	8.7	8.8	1.1
OXYH2	00	Z	500	22	0	11.5	14.7	9.1
OXYH2	12	Z	500	16	0	8.6	12.7	9.3
S6LA	00	Z	500	6	0	14.9	17.5	9.2
S6LA	12	Z	500	8	0	16.3	17.6	6.5
UCKZ	00	Z	500	7	0	8.2	18.2	16.3
WTEC	12	Z	500	1	0	0.0	10.0	10.0
03953	00	Z	500	30	0	9.5	15.3	11.9
03953	12	Z	500	30	0	11.0	18.5	14.8
04018	00	Z	500	30	0	12.0	14.7	8.4
04018	12	Z	500	30	0	9.1	11.7	7.2
04220	00	Z	500	29	0	12.6	12.8	2.1
04220	12	Z	500	29	0	10.1	10.2	-0.5
04270	00	Z	500	30	0	16.0	16.1	1.3
04270	12	Z	500	30	0	11.2	11.2	-0.5
04339	00	Z	500	27	0	16.0	23.8	17.6
04339	12	Z	500	28	0	12.7	14.9	7.8
04360	00	Z	500	27	0	12.6	13.0	3.3
04360	12	Z	500	26	0	9.6	9.7	-0.6
08001	00	Z	500	29	0	16.7	16.7	-0.6
08001	12	Z	500	28	0	11.0	11.1	-1.6
08508	00	Z	500	23	0	9.3	11.1	6.2
08508	12	Z	500	27	0	12.4	14.7	7.9
08522	00	Z	500	1	0	0.0	10.0	10.0
08522	12	Z	500	28	0	10.5	16.1	12.1
08594	12	Z	500	19	0	7.2	7.5	2.2
60020	00	Z	500	27	0	8.5	10.4	5.9
60020	12	Z	500	29	0	8.8	12.3	8.6
71600	00	Z	500	30	0	10.3	10.4	-1.4
71600	12	Z	500	30	0	12.4	14.2	-6.9
72201	00	Z	500	30	0	5.9	11.2	9.5
72201	12	Z	500	30	0	7.2	10.3	7.4
72402	00	Z	500	28	0	14.2	14.3	-1.5
72402	12	Z	500	27	0	18.7	18.8	1.4
74494	00	Z	500	28	0	10.5	10.5	0.3
74494	12	Z	500	30	0	10.0	10.3	-2.4
78016	00	Z	500	28	0	13.3	19.6	14.4
78016	12	Z	500	27	0	12.8	18.1	12.9

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	4	0	25	0.0	9.3	3.3
DBBH	12	V	100	10	0	10	0.0	3.0	2.1
EL/L7	00	V	100	1	0	0	7.4	1.1	0.2
ELML7	00	V	100	15	0	0	7.4	1.6	-1.5
ELML7	12	V	100	15	0	0	5.3	-0.9	0.5
FNOR	00	V	100	12	0	0	3.9	0.9	1.3
FNOR	12	V	100	11	0	0	3.6	-2.7	0.8
FNOU	00	V	100	12	0	0	3.9	-0.3	-2.0
FNOU	12	V	100	10	0	0	3.7	-0.8	0.9
FNPH	00	V	100	8	0	0	2.9	2.1	3.2
FNPH	12	V	100	8	0	0	2.9	-0.1	0.9
FNRS	00	V	100	10	0	0	2.9	1.3	-1.7
FNRS	12	V	100	9	0	0	4.1	-0.4	-1.2
JBOA	00	V	100	1	0	0	4.1	2.4	-0.2
JCCX	00	V	100	1	0	0	4.1	1.1	0.3
LDWR	00	V	100	23	0	0	3.3	-0.6	-0.6
LDWR	12	V	100	22	0	0	2.3	-0.4	-0.9
OVYA2	00	V	100	8	0	0	2.0	0.8	-0.4
OVYA2	12	V	100	11	0	0	2.0	0.6	0.9
OXYH2	00	V	100	17	0	5	2.6	-2.5	0.6
OXYH2	12	V	100	13	0	7	4.5	-1.6	-0.2
S6LA	00	V	100	6	0	0	4.4	-0.6	1.1
S6LA	12	V	100	5	0	0	4.4	-2.4	0.4
03953	00	V	100	23	0	0	3.2	0.5	1.6
03953	12	V	100	28	0	0	2.9	0.2	0.8
04018	00	V	100	29	0	0	2.5	0.1	-0.4
04018	12	V	100	30	0	0	3.1	0.8	-0.3
04220	00	V	100	22	0	0	2.1	0.2	-0.1
04220	12	V	100	22	0	0	2.6	0.1	1.6
04270	00	V	100	26	0	3	3.3	-0.1	2.5
04270	12	V	100	27	0	0	5.5	1.0	1.2
04339	00	V	100	20	0	5	4.6	-1.9	-1.4
04339	12	V	100	27	0	0	6.6	0.5	-1.3
04360	00	V	100	26	0	0	3.7	0.3	1.8
04360	12	V	100	26	0	0	2.9	-0.2	-0.3
08001	00	V	100	28	0	0	3.5	0.4	-0.6
08001	12	V	100	28	0	0	2.8	-0.3	0.2
08508	00	V	100	18	0	0	3.2	0.4	0.6
08508	12	V	100	14	0	0	2.5	-1.2	0.4
08594	12	V	100	20	0	100	3.6	-2.1	4.9
60020	00	V	100	1	0	0	2.9	5.5	2.3
71600	00	V	100	30	0	0	5.2	0.6	0.4
71600	12	V	100	30	0	0	4.0	1.3	1.3
72201	00	V	100	29	0	0	6.4	0.1	0.0
72201	12	V	100	30	0	0	3.3	0.0	0.2
72402	00	V	100	26	0	0	3.6	0.8	-0.8
72402	12	V	100	27	0	0	3.8	0.3	0.1
74494	00	V	100	20	0	0	2.7	-0.7	1.0
74494	12	V	100	27	0	0	3.2	-0.4	1.0
78016	00	V	100	28	0	0	8.9	1.2	2.1
78016	12	V	100	27	0	0	3.8	0.9	0.2

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: NOVEMBER 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	7	0	0	0.0	-0.5	0.1
DBBH	12	V	500	11	0	0	4.0	-0.5	-0.1
DBBH/24	00	V	500	1	0	0	3.6	-7.6	-1.7
EL/L7	00	V	500	1	0	0	3.6	-0.1	0.6
ELML7	00	V	500	17	0	0	3.6	-0.1	0.0
ELML7	12	V	500	19	1	5	2.9	7.8	-5.0
F/QH	00	V	500	1	0	0	3.8	-3.2	0.6
FNOR	00	V	500	14	0	0	3.8	0.8	2.3
FNOR	12	V	500	11	0	0	5.9	1.1	0.9
FNOU	00	V	500	12	0	0	5.5	0.2	0.9
FNOU	12	V	500	10	0	0	5.1	0.5	-0.7
FNPH	00	V	500	10	0	0	2.4	-0.2	0.2
FNPH	12	V	500	9	0	0	2.1	0.2	-0.1
FNRS	00	V	500	9	0	0	2.1	1.6	-0.9
FNRS	12	V	500	8	0	0	2.1	0.7	0.2
JBOA	00	V	500	1	0	0	2.1	-0.6	-1.7
JCCX	00	V	500	1	0	0	2.1	0.8	-0.1
LDWR	00	V	500	24	0	0	2.7	-0.9	1.1
LDWR	12	V	500	22	0	0	4.1	0.4	-0.4
OVYA2	00	V	500	11	0	0	3.0	-2.3	0.2
OVYA2	12	V	500	14	0	0	4.4	0.6	-0.6
OXYH2	00	V	500	18	0	5	3.1	-1.8	1.5
OXYH2	12	V	500	13	0	15	6.1	-2.8	0.5
S6LA	00	V	500	6	0	0	5.9	0.0	1.8
S6LA	12	V	500	7	0	0	5.9	1.7	-1.3
WTEC	12	V	500	1	0	0	5.9	-4.2	-2.0
03953	00	V	500	30	0	0	2.4	-0.9	-0.5
03953	12	V	500	30	0	0	2.8	0.9	0.4
04018	00	V	500	30	0	0	4.5	0.2	0.3
04018	12	V	500	30	0	0	2.8	0.4	-0.3
04220	00	V	500	22	0	0	3.6	1.0	1.1
04220	12	V	500	22	0	0	3.8	0.3	1.9
04270	00	V	500	29	0	0	4.5	-0.8	-1.3
04270	12	V	500	30	0	0	3.8	-1.3	-0.6
04339	00	V	500	25	0	4	4.7	-0.3	0.6
04339	12	V	500	27	0	0	4.2	-0.8	0.8
04360	00	V	500	26	0	0	5.8	0.8	1.0
04360	12	V	500	26	0	0	4.6	1.0	-0.6
08001	00	V	500	28	0	0	2.9	0.5	-0.8
08001	12	V	500	28	0	0	3.7	-0.3	0.3
08508	00	V	500	19	0	0	2.8	-0.4	0.4
08508	12	V	500	17	0	0	4.8	0.0	-0.8
08594	00	V	500	1	0	100	3.1	-4.9	0.8
08594	12	V	500	22	0	100	3.1	0.5	1.1
60020	00	V	500	20	0	0	2.5	0.7	0.9
60020	12	V	500	24	0	0	3.4	-0.3	0.2
71600	00	V	500	30	0	0	2.9	0.2	0.9
71600	12	V	500	30	0	0	2.8	0.8	1.3
72201	00	V	500	30	0	0	5.1	-0.6	-0.9
72201	12	V	500	30	0	0	2.2	1.0	-1.4
72402	00	V	500	27	0	0	2.5	0.1	0.4
72402	12	V	500	27	0	0	1.7	0.1	0.3
74494	00	V	500	28	0	0	2.8	-0.2	0.9
74494	12	V	500	29	0	0	2.7	-0.6	1.0
78016	00	V	500	27	0	0	3.8	-0.6	0.4
78016	12	V	500	27	0	0	2.7	0.2	1.1

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed $m\ s^{-1}$
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45